

An annotated checklist of the ants (Hymenoptera: Formicidae) of British Columbia

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ABSTRACT

This paper lists the ant species reported from, or likely to be found within British Columbia. Localities are given for each species, as are ecological notes and keys to the reported subspecies, genera, and species.

INTRODUCTION

The ants of British Columbia have been surprisingly poorly studied, despite their ubiquitousness. Buckell (1927, 1932) produced two checklists of species collected in BC, however few areas of the province were surveyed and some of the listed species have been reclassified or may have been misidentified. Blacker (1992) presented a more detailed list of species personally collected near Victoria, and Blades and Maier (1996) made an extensive collection of arthropods, including ants, on Mt. Kobau, near Osoyoos. Beyond these, researchers are left with lists from nearby provinces and states including southern and central Alberta (Sharplin 1966), the Yukon (Francoeur 1997), Washington (Smith 1941), Idaho (Yensen *et al.* 1977), Montana (Wheeler and Wheeler 1988), and Alaska (Nielsen, 1987). This paper provides an introduction to the ant species reported to occur, or likely to be found, within BC. Ecological notes and localities are also given and keys are provided for species reported from within BC.

The list of BC ant species and their localities was compiled from a number of sources, including literature references, from preserved specimens in institutional collections, and the personal collections of the authors.

Keys were modified from those of Hölldobler and Wilson (1990; subfamilies and genera), Creighton (1950; most species), Wheeler and Wheeler (1986; many species), Francoeur (1973; *Formica fusca* group), (Wilson 1955; *Lasius*), and (Snelling 1973; *Stenammas*). Where possible, these keys were checked for ease of use against identified specimens.

Ant systematics are rife with synonymies and taxonomic disagreements and the taxonomy of several of the most common genera in the province, such as *Myrmica*, *Leptothorax*, and *Formica* are particularly messy. For example, *Leptothorax muscorum* is treated here as a single species but actually represents a complex of closely related species. As a result, literature outside of the most recent revisions may be misleading. For the most part, we have used the nomenclature of Bolton (1995) and Smith (1979) and mostly avoided the use of subspecific names, although they are common in the older literature. Lists of synonymies, useful especially for disentangling older literature, can also be found in the above-mentioned references.

¹ This paper is dedicated to Gordon Ayre who passed away during the preparation of the manuscript.

British Columbia encompasses a greater range of landforms and climates than any other province in Canada. The landforms can be roughly grouped into a series of parallel systems that run northwest to southeast. Weather systems, moving predominantly from the west, interact with the parallel mountain systems to produce wet belts and rain shadows. This variability of climate, combined with diverse topography and a wide range of latitude, produce twelve distinct biogeoclimatic zones within the province (Farley, 1979; Krajina, 1959) and a wide range of potential habitats for ant species.

ANNOTATED LIST OF BC ANTS

Localities are referenced by author or by the location of preserved specimens, i.e., UBC = the Spencer Entomology Museum at the University of British Columbia; the Canadian National Collection (CNC); the Wallis Museum, Entomology Dept., University of Manitoba, Winnipeg (WM; mostly collected by G. L. Ayre); the Royal British Columbia Museum in Victoria (RBCM), and the collections of the authors, e.g. GLA = G. L. Ayre; KN = K. Naumann; WBP = W. B. Preston. When several localities are given for a species they are listed by region, and in the following order: Vancouver Island and the Gulf Islands, the Lower Mainland, The Southern Interior, the Columbia and Kootenays, the Cariboo-Chilcotin, and the North. Species denoted by * have not been reported from BC, but have from neighbouring areas. Species denoted by **, although reported from BC, may have been accidentally imported or misidentified in the literature.

Most of the anatomical terms used in this paper are diagrammed in Figures 1 and 2. Others are explained in the text. Approximate sizes are described as follows: minute = less than 2 mm long; small = 2-4 mm; medium = 4-6 mm; large = 6-8 mm; and very large = greater than 8 mm. The descriptions of behaviour include some terms which may be new to those unfamiliar with social insects. For example, polygynous species are those that can have more than one queen per colony. Absconding is the rapid removal of the colony to a new location. Polymorphism is the occurrence of more than one size category or morphological worker caste in a nest. The largest workers are called majors, or soldiers if they specialize in defense of the nest, and the smaller workers are called minors. Cleptobiotic species rob the food stores or scavenge from the refuse piles of another species but do not necessarily nest in close association with it. Xenobiotic species, also known as guest ants, live in the nest of host species and obtain food from them but generally keep their brood separate. Inquilines, also known as a permanent or obligate social parasites are queens that spends their entire life cycle in the nest of a host species; host workers care for the queen's reproductive offspring. Such parasitic species may produce few or no workers of their own. Temporary social parasitism occurs when a queen usurps the nest of a host species. Eventually her daughters replace the host workers. Dulotic, or slave-making, species raid the nests of other species, capture brood and rear them as enslaved nestmates. Nest budding is a form of colony multiplication in which one or more queens and a subgroup of workers leave an established nest to found another nearby. For a more detailed glossary of terminology see Hölldobler and Wilson (1990).

Ponerinae

Amblyopone

Members of this genus are found in wooded areas, especially where well shaded. They are generally subterranean. The workers are timid and slow moving, and the queen forages when nest founding. There are no distinctive worker castes, and the stinged workers resemble the always wingless queens.

A. oregonensis Wheeler: Found at low elevations near the coast. Small to medium-sized, dark

brown predators.

Localities: Galiano Island (UBC); Yale - in a rotten Douglas fir stump in dense forest (WM); Washington (Smith 1941).

Myrmicinae

Myrmica

Members of this genus live in moderately-sized colonies of 500-1500 workers, building their nests in soil, rotten wood, or under objects. They are carnivores and/or collectors of honeydew.

Many species from northern North America are closely related to Palearctic species. As a rule, they are inoffensive ants and will flee when disturbed. Undisturbed workers are rather sluggish. As in all the Myrmicinae, the pupae are never enclosed in cocoons. The following species are characterized by a dull head and alitrunk and a strongly shining gaster.

****M. alaskensis*** Wheeler: Typical of the transcontinental boreal forest. Nests mostly in dead wood. Medium-sized. Some authorities consider this to be a variety of *M. incompleta*. This species acts as the host of the xenobiotic species, *Formicoxenus quebecensis* and individuals of the latter have been collected at Overlander Falls, along the upper Fraser River, and *M. alaskensis* itself has been found at several localities near Jasper, Alberta (Buschinger *et al.* 1994). Reported also from the Yukon (Francoeur 1997) and Alaska (Nielson 1987).

M. brevispinosa Wheeler: Nests in open sandy habitats, often near stream valleys or the shores of permanent water bodies. Head dark reddish-brown to yellowish-red, alitrunk yellowish-red, gaster very dark red to dark reddish-brown. Small to medium sized.

Localities: North Vancouver (WM); Summerland (WM); Oliver (WBP); Kamloops; Chilcotin region; Cariboo region (Buckell 1932). Also reported from Alberta (Sharplin 1966); Alaska (Nielsen 1987); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

M. latifrons Stärke: Referred to *M. emeryana* Forel in most of the literature. Head and alitrunk coarsely rugose and reddish-brown. Gaster may be slightly darker. Medium sized (4-4.5 mm).

Localities: Victoria (Blacker 1992); Lytton (RBCM); Osoyoos (between 800 and 1500 m elevation) (Blades and Maier 1996, listed as *M. tahoensis*). Also reported from Alberta (Sharplin, 1966); Idaho (Yensen *et al.*, 1977) and Montana (Wheeler and Wheeler 1988).

M. incompleta Provancher: Forms large, polygynous colonies in moist, grassy habitats, or at forest or bog edges. Head and gaster dark and with coarse sulcations (grooves). Medium sized ants (4 - 6 mm long).

Localities: Victoria (Blacker 1992); Lens Creek, Mesachie Lake - in a log (RBCM), Mission (UBC); Sicamous - nest in soil in a meadow; Field - under a stone in dense forest (WM); Flathead (WBP); Minnie Lake (Buckell 1932); Westwick Lake.; Stanley (in the Cariboo region); Lac La Hache (RBCM); Blue River (WBP). Specimens of *M. incompleta* have also been collected in the Rocky Mtns and Peace River region of Alberta (Sharplin, 1966); in the Yukon (Francoeur 1997), Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

M. lobifrons Pergande: Nests in and near boreal bogs or other moist areas that are temporarily flooded, or riverbanks. Workers are small with reddish-black gaster and head and reddish-yellow to dusky red alitrunk. Listed from the Yukon (Francoeur 1997) and reported to occur from New Mexico and Nevada to Alaska (Wheeler and Wheeler 1986).

Manica

These ants build small colonies in openings in coniferous forests, often under stones in or near

creeks or river bottoms. Underground galleries are often connected to the surface by holes in the bottom of one or more small craters. Workers usually have an orange color and will bite or sting in defense of the nest. They have an unhurried but not sluggish gait. Their food source is unknown, but Wheeler and Wheeler (1986) suggest that they feed on ants of other genera.

M. hunteri (Wheeler): Nests in openings in coniferous forests. Concolorous, yellowish-red to dark reddish brown, with a dull head and alitrunk and strongly shining gaster. Medium-sized to large ants (5 - 7 mm).

Localities: Fruitvale - nest under a stone, surrounded by sand, in a larch/spruce forest (WM). Also reported from Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

M. invida Wheeler: Referred to as *M. mutica* (Emery) in most of the literature. This species is more xerophilous than most members of this genus and prefers unshaded nest sites. Found mostly in the drier regions of southern BC, although there is also a report from Alaska (Wheeler and Wheeler 1986). Capable of inflicting a painful sting, but rarely does unless the nest is disturbed. Small to medium-sized. Concolorous yellowish-red to dark reddish-brown. Head and alitrunk dull, gaster strongly shining.

Localities: Summerland - tunnelled into the exposed gravel bank of a creek (WM); Oliver (WBP). Also reported from Alberta (Sharplin 1966) and Idaho (Yensen *et al.* 1977).

Pogonomyrmex

Also known as harvester ants, this group is widespread throughout southwestern North America, but is poorly represented in BC. They collect seeds. Nests are built in soil, fully exposed to the sun.

P. salinus Olsen: (= *P. owyheei* Cole) Nests are conical pebble mounds, with basal entrances and peripheral clearings. They are usually about 50 cm across at the base, and low. These ants are active harvesters that store and eat large quantities of seeds. A dump of chaff can often be seen at the edge of the nest. The workers are pugnacious and can inflict a painful sting. They are medium-sized to large and brown to red in colour.

Localities: At low elevation sites in the Okanagan south of Penticton (Buckell 1927); specifically Osoyoos; Oliver; Keremeos (Buckell 1932; Blades and Maier 1996; WBP).

Stenammina

Members of this genus usually form colonies of several dozen individuals in wooded areas, beneath logs, stumps, branches, rocks, moss or debris. They feed mostly on other arthropods. Workers are sluggish, timid, and rarely seen outside of the nest.

S. diecki Emery: Nests, usually of about 100 workers, are found in rotten wood or under objects, often in shaded sites. They are adapted to various habitats - Blacker (1992) reported that they can be found in red cedar forests. These are small ants (3.5 mm), slender, and dark reddish brown. Head dull, alitrunk moderately shining, and gaster strongly shining.

Localities: Victoria; Thetis Island (Blacker 1992); Yale - nest under the bark of a rotting stump in dense deciduous forest (WM). Also listed from Idaho (Yensen *et al.* 1977) and Washington (Smith 1941).

S. occidentale Smith: Bolton (1995) suggested that this species should be called *S. snellingi*. Nests in soil, under rocks. Workers are small and reddish-brown. Stated to occur in BC by Smith (1979); in Idaho by Yensen *et al.* (1977) and Snelling (1973), and in Washington

(Snelling 1973).

*****S. brevicorne*** Mayr: Quoted by Buckell (1927) (as *S. neoarcticum*) as occurring in BC, but Smith (1979) considers this small-workered species to occur east of Colorado. Smith (1957) shows the westernmost occurrences in Nebraska and Minnesota. Gregg (1963) lists this species from Colorado.

Aphaenogaster

Most *Aphaenogaster* species nest in the soil beneath some protecting object. They are predominantly carnivores, and also show rapid and well-organized absconding behavior in the presence of a major threat from enemies or flooding. They can be distinguished from *Myrmica* species by possessing unpectinated (non-comb-like) spurs on the hind tibiae (*Myrmica* spurs are comb-shaped) and their colonies are also usually more populous (Cole 1942). *Aphaenogaster* workers are more slender and shining. Workers are most often seen above ground in the evening.

A. occidentalis Emery: It usually prefers open and dry nest sites, forming nests of several hundred individuals. Workers are slow moving and may hide when disturbed. They are small to medium-sized (4-5 mm), brown to reddish brown, with head dull, or the posterior portion shining, alitrunk feebly shining, and the gaster strongly shining.

Localities: Victoria; Thetis Island (Blacker 1992); Vancouver (UBC); Yale; Lytton; Lillooet (CNC); Osoyoos (below 1500 m, Blades and Maier 1996; WBP); Westbank - under a stone in open ground (WM; WBP); Summerland; Oliver; Savona; Anarchist Mountain - under a stone in open fir and pine forest; Kalamalka Lake (WM); Lower Nicola (WBP); Kamloops (Buckell 1932); Balfour (WBP); Slocan district (UBC); Trail; Waneta (WM); Chilcotin region (Buckell 1932).

Pheidole

These ants are mainly seed harvesters, and although the genus includes many species, they are found predominantly in the arid southwest of North America. The majors characteristically have very large heads, and may act as seed huskers or soldiers. Colonies usually contain less than 300 individuals and are found in the soil, either under stones or without cover.

P. californica Mayr: Nests under objects. Major workers are small and vary from concolorous yellow to bicoloured with head and alitrunk red and gaster dark-reddish brown. Minor workers are minute (<2 mm), and bicoloured. Both worker classes are shining.

Localities: Osoyoos (Buckell 1927; UBC). Blades and Maier (1996) report *Pheidole* sp. from Osoyoos (probably *californica*?). Listed from Washington by Smith (1941).

Monomorium

These are small ants, adaptable with respect to nesting sites. They may nest in preformed cavities such as openings in plant litter or rotting wood or spaces in the walls of buildings.

M. pharaonis (Linnaeus): This is a tramp species, i.e., widely distributed because of human commerce and living in close association with humans, and a notable house pest that probably arrived in North America from Africa or tropical Asia. Workers are small, stingless, and the colour is light reddish-yellow to brown with the gaster somewhat darker. The head and alitrunk are densely punctate (covered with minute pits). Multiqueen colonies can contain up to 300,000 workers. It is a common pest in apartments in Vancouver.

****M. minimum*** (Buckley): Although Smith (1979) states that this small ant is rare or absent from

the Pacific Northwest, it has been reported from Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

Solenopsis

These ants are often small and lestopibiotic (living in, and stealing from, the nests of other species). The group includes a notable pest, the fire ant, *S. invicta*, an import from Brazil, which has become an agricultural and public health problem in the southeastern United States.

S. molesta (Say): A lestopibiotic species that occasionally infests houses, establishing nests in woodwork and masonry. They are omnivorous and will eat insects, seeds, and honeydew, as well as meats, bread, grease, fruits, nuts, and sweets. Strongly shining, minute ants (approximately 1.3 mm long), mostly reddish-brown in color.

Localities: Osoyoos (WM; Buckell 1932), below 800 m (Blades and Maier 1996); Westbank - under stones, tunnelled into soil, and in creek banks; Summerland - taken with an excavated nest of *Manica mutica*; Oliver; Lillooet (WM); Flathead (WBP). Buckell (1927) reported this insect to be common throughout BC. Also reported from Alberta (Sharplin 1966); Alaska (Nielsen 1987); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

Leptothorax

These species nest in living or dead trees, decaying wood, soil, or stumps. Because of inconspicuous habits and small colonies (50 - 200 workers) they are often overlooked. Many nest by choice in preformed cavities. Nests often adjoin those of other, larger ant species, and the workers may steal food from the larger nest. Some species are inquiline (social parasites) that lack a worker caste, and others dulotic (conducting slave raids in which brood, and especially pupae, are removed to the home nest).

****L. acervorum*** (Fabricius): Reported from the Yukon by Francoeur (1997).

****L. faberi*** Buschinger: An obligate social parasite of the "*L. muscorum* group" *sensu lato*. Queens are more likely to be found than workers, and they can be differentiated from their hosts by larger size, darker colour, and the presence of a post-petiole ventral spine. Described from Jasper National Park in Alberta (Buschinger 1981). Francoeur (1997) reported a *Leptothorax* sp. nr. *faberi* from the Yukon.

L. muscorum (Nylander): This name has been applied to what is a complex of species, including the most northern new world ants. By comparing chromosome numbers, Loiselle *et al.* (1990) determined that the complex includes at least four species in North America. They are found mostly in woodlands where they nest in decaying stumps, logs, or under logs or rocks. Small ants, mostly dark reddish-brown in color. Head and alitrunk are dull, and the gaster strongly shining. Distribution extends from Arizona through to Alaska and the North West Territories, and throughout northern Europe. Some authorities, e.g. Creighton (1950), consider *L. muscorum* to be solely an old world species, and refer to our species (complex) as *L. canadensis* Provancher.

Localities: Victoria (Blacker 1992); Cordova Bay; Vancouver; North Vancouver (WM); Hope (RBCM); Osoyoos (between 800 and 1500 m elevation) (Blades and Maier 1996); 94 Mile House (RBCM); Chilcotin region (Buckell 1932); Westwood Lake (Cariboo region; UBC); Lens Mountain (RBCM). Also reported from Montana (Wheeler and Wheeler 1988).

L. nevadensis Wheeler: Blackish, 2.5 mm workers, bearing 12 segmented antennae with dark coloured clubs.

Localities: Victoria (Blacker 1992); Osoyoos (from valley bottom to 1850 m elevation) (Blades

and Maier 1996); Oliver (WBP); Balfour (WBP); Waneta - nests found in mixed open forest and dry benchland, one tunnelled under the bark of a decayed stump (WM). Also reported from Montana (Wheeler and Wheeler 1988).

L. nitens Emery: Found under rocks and in duff. Small, pale yellow ants.

Localities: Osoyoos (below 800 m elevation) (Blades and Maier 1996); Washington (Smith 1979); and Idaho (Yensen *et al.* 1977).

****L. retractus*** Francoeur: Nests in dead wood in forested habitats. Found in the Yukon (Francoeur 1997).

L. rugatulus Emery: Nests in dry, grassy sites, under wood, stones, in decaying wood, or under grass clumps. Small (2.5-3 mm), with dull head and alitrunk, gaster strongly shining. Solidly built, with a box-shaped alitrunk.

Localities: Victoria (Blacker 1992); Vernon (UBC); Lillooet (WM); Osoyoos (below 1500 m elevation)(Blades and Maier 1996); Westbank - in soil under a log; Summerland - in open forest in a ponderosa pine cone embedded in the soil (WM); Cache Creek (RBCM); Balfour (WBP); Waneta (WM). Also reported from Montana (Wheeler and Wheeler 1988).

Formicoxenus

This genus was revised by Francoeur *et al.* (1985) and includes several species that were previously included in the genus *Leptothorax*. The ants of this genus are characterized by a xenobiotic lifecycle and the production of several types of functional queens including winged individuals with fully developed alitrunks (gynomorphs), wingless individuals without wing-associated thoracic structures (ergatomorphs), most of which act as workers, and intermorphs, which are intermediate in morphology.

****F. diversipilosus*** (Smith): A guest ant in the nests of *Formica obscuripes*, *F. ravidia*, and *F. integroides*. Reported from Washington (Alpert and Akre 1973), and Idaho (Yensen *et al.* 1977).

F. quebecensis Francoeur: A guest in colonies of *Myrmica alaskaensis*. Distinct from other members of the genus in having both winged and non-winged males.

Localities: Overlander Falls (along the upper Fraser River), and reported from several sites near Jasper, Alberta (Buschinger *et al.* 1994).

****F. provancheri*** (Emery): A guest ant of *Myrmica incompleta*. Might be found, together with its host, in many locations in the province. Reported from Alberta (Francoeur *et al.* 1985) and Montana (Wheeler and Wheeler 1988).

Doronomyrmex

This genus contains species that are obligate social parasites, i.e., they produce few or no workers and reproduce when a queen usurps the colony of another species.

****D. pocahontas*** Buschinger: An obligate social parasite of a small member of the *Leptothorax muscorum* complex. Described from Jasper National Park, Alberta by Buschinger (1979).

Tetramorium

This genus contains some important household pests.

**T. caespitum* (Linnaeus): This species may be of European origin. It builds colonies under stones, near building foundations, and commonly infests houses where the omnivorous workers seem to show a preference for meat or grease. Workers are small, and dark reddish or brownish-black, although they appear black in the field. Found in Washington (Smith 1979) and probably occurs in towns in BC.

Dolichoderinae

These are mostly small, drab coloured ants. They are characterized by a single segmented pedicel, no constriction between the first and second gastric segments, and a slit-like cloacal orifice. The pupae are naked.

Tapinoma

Workers commonly attend honeydew secretors such as aphids. They also emit a substance that smells like butyric acid.

T. sessile (Say): An adaptable species that may nest in the soil beneath objects or infest houses. Nests may contain thousands of individuals. Workers are 2.5 - 3 mm long and yellow-brown to blackish in colour.

Localities: Victoria (WM; Blacker 1992); Cordova Bay (WM); Courtenay (UBC); Mesachie Lake (WM, RBCM); Mission (RBCM); Osoyoos (from valley bottom to 1850 m elevation, Blades and Maier 1996; also WBP); Oliver (WM, WBP); Penticton; Kamloops (Buckell 1932); Lillooet (Buckell, 1932; WM), Vernon (UBC); Sicamous; Westbank; Savona; Anarchist Mountain (WM); Cache Creek (RBCM); Balfour (WBP); Columbia Lake (WM); Flathead (WBP); Chilcotin region (Buckell 1932). Also reported from the Yukon (Francoeur 1997) and Montana (Wheeler and Wheeler 1988).

Liometopum

These ants nest in the soil beneath cover, or under bark or in tree crevices. The nests, which are sub-divided by paper-like material, are often difficult to find. The workers commonly forage in single file, and many attend honeydew secretors. They are pugnacious and eject a substance that smells like butyric acid when threatened.

***L. apiculatum* Mayr: Workers are small to medium-sized and dark reddish-brown. Reported by Buckell (1932) from Naramata, however, Smith (1979) described this species as occurring in the U.S. southwest and Mexico, in foothills at elevations of 1,000 - 2,000 m.

Formicinae

This subfamily is the predominant group in North America. They are especially common in BC. They lack a sting but are able to eject formic acid when disturbed.

Brachymyrmex

These ants usually build small colonies in the soil, under objects. They attend honeydew-secreting insects.

B. depilis Emery: Nests are in the soil under some object. Workers are minute (1.5-2 mm), pale brown, slow-moving, and inconspicuous. They feed chiefly on honeydew secreted by aphids and mealy bugs on the roots of plants, and spend almost all of their time underground.

Localities: Victoria (Blacker 1992); Vancouver (UBC); Lillooet (CNC); Westbank; Anarchist Mountain; Trail; Waneta (WM); Balfour (WBP).

Camponotus

These are called the carpenter ants because of their preference for making nests in wood. They do however, also nest in the soil, and under or in hollow twigs or branches. Workers are highly polymorphic and can become aggressive and bite in defense of a nest.

C. essigi-hyatti complex: Small colonies with several dozen to a few hundred workers. Workers are smooth and shining and vary in size from small to large. Specimens collected by G. L. Ayre in Osoyoos in 1972 were determined at the time by R. Snelling to belong to the *essigi-hyatti* complex. These specimens key out to *C. cf. hyatti* Emery using the keys of Snelling (1988) and Wheeler and Wheeler (1986). They may be a new species in this complex.

Localities: Osoyoos, under the bark of sage brush, *Artemisia tridentata*. (WM).

C. herculeanus (Linnaeus): Large colonies can be found in rotting logs and stumps, especially of conifers. A common structural pest. The head and gaster of the major workers are black and the alitrunk black anteriorly and red posteriorly. Head and alitrunk moderately shining, the gaster dull. Workers are large to very large.

Localities: Mesachie Lake (WM); Princeton (UBC); Cache Creek (RBCM); Clinton; Lillooet (WM); Douglas Lake, Revelstoke, Invermere (Buckell 1932); Arrow Lake (Buckell 1927); Chilcotin and Cariboo regions (Buckell 1932); Blue River (WBP). Also reported from the Yukon (Francoeur 1997); Alaska (Nielsen 1987); the North West Territories (Brown 1949); Alberta (Sharplin 1966), Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988). This species no doubt occurs in northern BC as well.

C. laevigatus (Smith): Has habits similar to *C. herculeanus* and is also occasionally found in buildings. Buckell (1927) reported that this species was not common, and could usually be taken from fir logs at higher elevations. Workers are large to very large, and entirely black and shining, often with bluish reflections.

Localities: Thetis Island (Blacker 1992); Cordova Bay (RBCM); Nanaimo; Osoyoos (between 800 to 1500 m elevation, Blades and Maier 1996; WBP); Westbank (WBP); Lillooet (WM); Cranbrook (Buckell 1932); Lens Creek (RBCM). Also reported from Montana (Wheeler and Wheeler 1988).

C. modoc Wheeler: Some consider this a subspecies of *C. herculeanus*. Workers are medium-sized to very large, black with golden yellow setae and pubescence on the gaster. The head is feebly shining to dull, and the alitrunk and gaster dull. Nests of several hundred to 1000 workers are usually found under or in wood, and workers may be seen climbing trees, possibly to take honey dew from aphids.

Localities: Victoria; Thetis Island (Blacker 1992); Brentwood Bay (WM); Mesachie Lake (RBCM); Qualicum Beach (WBP); North Vancouver (WM); Port Coquitlam (WBP); Vancouver; Armstrong (KN); Oliver (WBP); Summerland; Greenwood; Clinton; Lens Creek; Lytton (RBCM); Columbia Lake; Fruitvale, (WM); Balfour; Flathead (WBP); Chilcotin region (Buckell 1932); Lac la Hache (RBCM). Also reported from Montana (Wheeler and Wheeler 1988).

C. nearcticus Emery: Constructs small nests in dead twigs and branches, under the bark of live or dead trees, in galls, pine cones, rotting logs, stumps, fence posts, or roofing. Medium-sized to very large.

Localities: Osoyoos (below 800 m elevation) (Blades and Maier 1996); Balfour (in house; WBP). Also listed from Alberta (Sharplin 1966) and Idaho (Yensen *et al.* 1977).

C. noveboracensis (Fitch): This may, like *C. modoc*, also be a subspecies of *C. herculeanus*, and is also an occasional house pest. Workers are dull, varying to head and alitrunk dull with a moderately shining gaster. The head is black to reddish black, alitrunk red, and gaster black, and the size large to very large.

Localities: Mesachie Lake (RBCM); Port Coquitlam (WBP); Oliver (WBP; Buckell 1932); Keremeos, (Buckell 1932); Lillooet (WM); Lytton; Lens Creek, (RBCM); Chilcotin region (Buckell 1932). Also in Alberta (Sharplin 1966) and Idaho (Yensen *et al.* 1977).

**C. semitestaceus* Emery: Nests under stones, or in soil surmounted by low craters. Workers are large to very large; the largest workers have a reddish head, pale yellow alitrunk and anterior of the gaster with the remainder of the gaster brown. Found in Washington (Smith 1979).

C. vicinus Mayr: Nests in soil under stones, or rotting wood buried in the soil. The head and gaster are black, and the alitrunk and legs red, although some small workers may appear entirely black in the field. Large to very large. May be largely nocturnal (Blacker 1992).

Localities: Victoria; Thetis Island (Blacker, 1992); Mesachie Lake (RBCM); Galiano Island; Vancouver (UBC); Coquitlam (WBP); Osoyoos (below 1500 m elevation, Blades and Maier 1996; WBP); Oliver (WBP); Rock Creek; Vernon; Kamloops; Nicola Lake; Lillooet; (Buckell 1932); Westbank (WBP; WM); Anarchist Mountain; Oliver; Kalamalka Lake (WM); Lytton; Lens Creek; Robertson Valley; Clinton (RBCM); Summerland; Penticton (WM); Balfour (WBP); Waneta (WM); Chilcotin region (Buckell 1932). Also reported from Montana (Wheeler and Wheeler 1988).

Lasius

Members of this group build nests in exposed soil, under objects, or in rotting wood. The colonies are small to medium-sized, and the workers may attend or foster honeydew-excreting insects. Many of the species found here have a holarctic distribution.

L. alienus (Foerster): Prefers well or partially shaded woodlands, although occasionally found in open areas. Nests are found under rotting logs or rocks, and may contain several thousand workers. May invade houses. Workers are small (2.3-3 mm), dull, and dark reddish-brown.

Localities: Victoria (Wilson 1955); Mesachie Lake (RBCM); Cordova Bay; North Vancouver (WM); Vancouver (UBC; WBP); Queen Charlotte Islands (UBC); Hope (RBCM); Manning Park (Wilson 1955); Yale (WM); Osoyoos (WM); Oliver (WBP); Okanagan Falls (Buckell 1932); Westbank (WM); Lillooet (Wilson 1955); Monashee Mountains; Emerald Lake (near Field) (Wilson 1955); Slocan (UBC); Fruitvale; Waneta, (WM); 70 Mile House (RBCM); Blue River (WBP). Also reported from Montana (Wheeler and Wheeler 1988).

L. crypticus Wilson: Nests under stones or builds crater nests in open areas. Workers are small and reddish-brown.

Localities: Osoyoos (below 1500 m elevation; Blades and Maier, 1996); Oliver (WBP); Westbank; Greenwood; Savona; Columbia Lake (WM). Also reported from Montana (Wheeler and Wheeler 1988).

L. fallax Wilson: Nests under stones in forest clearings. Workers are small and brown.

Localities: Osoyoos (between 800 and 1500 m elevation) (Blades and Maier 1996). Also reported from Montana (Wheeler and Wheeler 1988).

L. flavus (Fabricius): Subterranean. Nests mostly under stones. May attend aphids that feed on the roots of grasses. Workers are moderately shining, small, with a brown head and reddish-

yellow alitrunk and gaster.

Localities: Westbank (WM); Osoyoos; Chilcotin region (Buckell 1932). Listed from Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

L. neoniger Emery: Builds nests with a sandy crater or nests under stones in open areas. The distribution of this species may be influenced by a tendency to nest along roadsides. The small, dark reddish-brown workers tend honeydew-secreting insects.

Localities: Osoyoos (below 800 m elevation)(Blades and Maier 1996); Oliver (WBP); Armstrong (WM). Reported from Alberta (1966); the Yukon (Francoeur 1997); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

****L. niger*** (Linnaeus): nests under stones in both forest and open situations. Found in Washington (Smith 1979) and Idaho (Yensen *et al.* 1977). Wheeler and Wheeler (1986) consider that this is in fact *L. alienus*.

L. pallitarsis (Provancher): Usually nests in forested areas, in rotting logs and stumps, or under stones, but is sometimes abundant in grasslands. Eats a variety of foods and is sometimes associated with aphids and coccids. An occasional house pest. Workers are approximately 3.5 mm long and brown. The head is shining, the alitrunk and gaster moderately shining. Distributed throughout all of southern BC, and in the north, west of the Rocky Mountains.

Localities: Victoria (Wilson 1955); Mesachie Lake (RBCM); Brentwood Bay; Cordova Bay (WM); Alert Bay (Wilson 1955); Galiano Island (UBC); Vancouver (WBP; WM; UBC); North Vancouver; Deep Cove (WM); Chilliwack (Wilson 1955); Yale (WM); Osoyoos (between 800 and 1500 m elevation) (Blades and Maier 1996); Terrace (Wilson 1955); Sicamous (WM); Salmon Arm (Buckell 1932); Penticton; Chase; Glacier; Howser (Selkirk Mtns)(Wilson 1955); Balfour (WBP); Fruitvale; Kinnaird (WM); Creston (WBP); 100 Mile House; 70 Mile House; Lac La Hache, (RBCM); Tete Jaune Cache (WBP). Reported from Alaska (as *L. sitkaensis*; Nielsen 1987). Also reported from Montana (Wheeler and Wheeler 1988).

L. subumbratus Viereck: A temporary social parasite of *L. pallitarsis*. It nests under stones or rotting logs. Workers are small and concolorous reddish-yellow. The head and gaster are shining and the alitrunk moderately shining.

Localities: Keremeos (Buckell 1932). Listed from Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

****L. umbratus*** (Nylander): Is reported from Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988). Workers are small with shiny, yellowish-red head and gaster and a dull, reddish-yellow alitrunk.

L. vestitus Wheeler: Small yellowish-brown, strongly shining ants. The entire body of the workers is covered with long, mostly erect, silky yellow setae. So much so, in fact, that the gaster has the appearance of a brush in side view. Said to be concentrated along the Pacific coast (Wilson 1955) but in the U.S. found inland as far as Idaho (Yensen *et al.* 1977) and Nevada (Wheeler and Wheeler 1986).

Localities: Nanaimo; Forbidden Plateau (Vancouver Island)(Wilson 1955).

Acanthomyops

Most members of this genus nest in the soil, usually beneath objects, but they are also found nesting in rotting logs and stumps, under basements, or around the foundations of buildings. They are mostly subterranean, and some foster honeydew secretors. The queens and workers have a

citronella or lemon-verbena odor, and the winged queens are often mistaken for termites. Most, or all are temporary social parasites of *Lasius* species. The workers are relatively slow moving and run about when disturbed. They are small (<4 mm), yellow to yellowish-brown, and shining. Their food is mainly honeydew from aphids or coccids.

A. coloradensis Wheeler: Nests mostly under stones. Small, strongly shining ants with a brownish-yellow head and gaster and a yellow alitrunk.

Localities: 70 Mile House (RBCM). Also found in Alberta and south to New Mexico (Smith, 1979), including Montana (Wheeler and Wheeler 1988).

A. interjectus Mayr: Found in woodlands, pastures, and meadows, under objects, near foundations, or in the open with a small mound.

Localities: Kamloops (Buckell 1932). Listed from Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

A. latipes (Walsh): Nests are found in open woodlands, meadows, or pastures, in exposed soil with a mound, or at the base of stumps. The workers are small and shining, with brown head, brownish-yellow alitrunk, and brown to brownish-yellow gaster. They are distributed coast to coast in southern Canada.

Localities: Vancouver (KN); Lillooet (CNC); Kamloops (Buckell 1932); Keremeos (UBC). Also reported from Montana (Wheeler and Wheeler 1988).

A. occidentalis (Wheeler): Nests under stones in dry sandy soil. Workers are small and yellowish-brown in colour.

Localities: Westbank (WM). Also reported from Montana (Wheeler and Wheeler 1988).

*****A. claviger*** (Roger): Reported by Buckell (1932) from Penticton; Minnie Lake and the Chilcotin region, but considered by Smith (1979) to be a species of eastern North America.

Myrmecocystus

The species of this genus are mostly predator-scavengers but they also collect honeydew, and unusually, the carbohydrate rich secretions of plants. They are associated with arid climates and are best known for the presence of individuals known as repletes. Repletes act as living storage jars for honeydew or nectar; their gasters can swell to the size of a pea. They hang suspended from a gallery ceiling until their stores are required by the colony.

M. testaceus Emery: This nocturnal species forms nests in well drained, stony or sandy soils. Workers are medium-sized and shining, with yellow head and alitrunk, brownish-yellow gaster, and large, black eyes.

Localities: Osoyoos (below 800 m elevation) (Blades and Maier 1996).

Formica

This is the largest genus of ants north of Mexico. Although most species are predators and scavengers and will collect honeydew, they show a great diversity of habits and can be subdivided into several species groups. They are mostly medium-sized to large ants, with the workers commonly 4 - 8 mm long, although some species may be smaller. They release formic acid as a defensive compound.

Neogagates group. These ants form small colonies (to several hundred individuals) in soil, frequently under objects. They are the smallest ants in the genus *Formica* and are commonly

enslaved by members of the *microgyna* and *sanguinea* species groups. All workers have a shining surface.

F. lasioides Emery: Commonly found in grasslands under stones or in nests with exposed entrances or small craters. The workers are small to medium-sized and the colour can be variable but the head and gaster are usually reddish-black and the alitrunk dusky red or yellowish-red. There are a few erect setae on the antennal scapes. Shining to strongly shining. They are distributed coast to coast in southern Canada and north into Alaska.

Localities: Hope (RBCM); Kamloops; Vernon; Nicola (UBC); Osoyoos (above 800 m elevation)(Blades and Maier 1996); Lillooet; Anarchist Mountain; Summerland; Edgewood (WM); Lens Mountain (RBCM); Chilcotin region (Buckell 1932). Reported from Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

F. manni Wheeler: Nests under stones in gravelly or sandy soil, usually in arid areas. Head and alitrunk reddish-yellow and gaster reddish-black varying to head and alitrunk reddish-brown, gaster black. Small to medium-sized and shining. Workers are fast and timid, although large colonies may be aggressive.

Localities: Lac du Bois (near Kamloops), (UBC). Listed from Idaho (Yensen *et al.* 1977).

F. neogagates Emery: Nests in woodlands, under various covering objects, and often forming a mound of soil. Head and gaster dusky red and alitrunk dark reddish brown varying to head dark red dorsally and brown ventrally, alitrunk reddish-yellow with brown markings, and gaster dark reddish brown. Small to medium-sized and strongly shining.

Localities: Osoyoos (below 800 m elevation)(Blades and Maier 1996), (Buckell 1932; UBC); Oliver (Buckell 1932; UBC); Greenwood (WM); Westbank (WM; CNC); Cache Creek (RBCM); Chilcotin region (Buckell 1932). Also reported from Montana (Wheeler and Wheeler 1988).

F. vinculans Emery: Considered by some to be a subspecies of *F. neogagates*. Nests in open, sunny, prairie-like locations utilizing some vegetative debris. When nests are disturbed, the workers display aggressive alarm. Alitrunk paler than head and gaster.

Localities: Osoyoos (Maier and Blades 1996).

****F. bradleyi*** Wheeler: This species occurs in sandy regions. The workers are small to medium-sized and yellowish red. Reported from Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

***Fusca* group.** Nests are in the soil and are usually started under a protecting object. The nest entrance is surrounded by a low mound or irregular crater of soil. Members of this group are commonly used by slave-making *Formica* species. The workers are generally fast and timid, but actively defend large colonies. This group is discussed in detail by Francoeur (1973).

F. accreta Francoeur: Relatively docile ants, black, and 4-7 mm long. Nests may contain over 1000 workers, are found in the soil, and are usually started under a rock or object. Blacker (1992) reported this to be the most conspicuous ant in Victoria.

Localities: Thetis Island (Blacker 1992); Victoria; Sidney; James Island (near Saanich); New Westminster; Kootenay Lake (Francoeur 1973). Also reported from Washington; Idaho and Montana (Francoeur 1973).

F. aerata Francoeur: Nests under rocks in sandy soil. Workers are small, brown-coloured with a silky lustre due to pubescence. Francoeur (1973) reported this species from California, Nevada,

and Oregon. To our knowledge this is the first report of this species in Canada.

Localities: Kalamalka Lake (WM); Oliver; Balfour (WBP).

F. argentea Wheeler: Nests in open or semi-open areas; usually in sandy soil, under a rock or with a low mound. Very active ants, they occasionally infest houses. Workers are small to medium-sized, and brownish-black with a silvery luster given by the pubescence. This species occurs coast to coast in North America.

Localities: Cordova Bay (WM); Victoria; Hope (Francoeur 1973); Osoyoos (from valley bottom to 1850 m elevation) (Blades and Maier 1996); Lytton (RBCM); Lillooet (Buckell 1932); Princeton (UBC); Vernon; Kelowna; Penticton; Kaslo; Creston; Cranbrook (Francoeur 1973); Trail; Waneta (WM). Also reported from Montana (Wheeler and Wheeler 1988).

F. fusca Linnaeus: Nests in a wide variety of situations. Workers small to medium-sized. Head dusky red, alitrunk and gaster dark reddish-brown varying to concolorous black with pale appendages. Shining, especially the head and gaster. Found from Arizona to the Yukon and east to Newfoundland, and probably throughout much of BC.

Localities: Patricia Bay; North Vancouver (WM); Terrace (Francoeur 1973); Manning Park (UBC); Osoyoos; Kaleden (Buckell 1932); Vernon, (UBC); Westbank; Anarchist Mountain (WM); Lillooet (WM, CNC); Merritt; Kaslo; Selkirk Mountains (Francoeur 1973); Flathead (WBP); Lac La Hache (RBCM); Chilcotin and Cariboo regions (Buckell 1932). Also reported from Montana (Wheeler and Wheeler 1988).

****F. gagatoides*** Ruzky: An apparently holarctic species that resembles *F. neorufibarbis*. Found in northern Scandinavia and Siberia and reported from the Yukon by Francoeur (1997).

F. hewitti Wheeler: Nests under rocks, in rotting logs in open or in semi-open, late-succession boreal forests. Medium-sized and dark brown to reddish-black. Head and alitrunk feebly shining, gaster shining.

Localities: Oliver (WBP); Loon Lake (near Kamloops)(Francoeur 1973); Emerald Lake (near Field) (Buckell 1927; 1932). Listed from Alberta (Sharplin 1966); the Yukon (Francoeur 1997); Idaho (Yensen *et al.* 1977) and Montana (Francoeur 1973; Wheeler and Wheeler 1988).

F. montana Emery: A prairie species that builds earthen mounds, sometimes incorporating thatch or covered with grass.

Localities: Trail (CNC, WM); Alberta (Sharplin 1966) and Montana (Wheeler and Wheeler 1988).

F. neoclara Emery: Usually found in sandy soils in grasslands or open woods; sometimes at the base of plants, and sometimes in low, loose mounds of vegetation and excavated soil with many entrances. Adapts easily to man-made environments. Often forms populous colonies. Workers 3-4 mm long with blackish gaster, red-brown alitrunk and head red ventrally and reddish-black dorsally.

Localities: Mesachie Lake (RBCM); North Vancouver (WM); Chilliwack; Oliver, (Buckell 1927, 1932); Alexandria (UBC); Penticton; Okanagan Falls; Vernon (Francoeur 1973); Lower Nicola; Westbank; Osoyoos; Malakwa; Tete Jaune Cache, (WBP); Field; Golden, (Francoeur 1973); Columbia Lake, (WM); Lac La Hache, (RBCM); Clinton; Chilcotin region (UBC); Hazelton (Francoeur 1973). Reported from the Yukon (Francoeur 1997); North West Territories; Washington; Idaho and Montana (Francoeur 1973). Wheeler and Wheeler (1988) also list this species from Montana. Probably also in northern BC.

F. neorufibarb Emery: A dominant ant in the boreal and alpine forests of North America; usually nests in rotting wood, and occasionally under stones, or in decaying sphagnum moss. The small to medium-sized workers are timid, and show a black head and gaster and red alitrunk.

Localities: Victoria (Blacker 1992); Vancouver Island; Vancouver (Francoeur 1973); Stave Lake; Manning Park (UBC); Port Coquitlam (WBP); Similkameen district (UBC); Merritt (Francoeur 1973); Lower Nicola (WBP); Osoyoos (between 800 and 1500 m; Blades and Maier 1996; Buckell 1927, 1932); Kelowna; Kaslo; Invermere (Buckell 1927, 1932); Kaslo; Mount Revelstoke; Carbonate (East Kootenay); Field (Francoeur 1973); Flathead (WBP); Tete Jaune Cache (WBP); Barkerville; Chilcotin region (Buckell 1927, 1932); Terrace; Queen Charlotte Islands; Liard Hot Springs (Alaska Highway) (Francoeur 1973). Also reported from the Yukon (Francoeur 1997) and Montana (Wheeler and Wheeler 1988).

F. pacifica Francoeur: The workers are small to medium-sized and have a fine, dense, bronze pubescence on the alitrunk, and a dark head and gaster. In Victoria, they are often found between cracks in concrete (Blacker 1992).

Localities: Clayoquot Sound (UBC); Rosedale (Francoeur 1973); Port Coquitlam (WBP); Washington (Francoeur 1973); Idaho (Yensen *et al.* 1977).

F. podzolica Francoeur: Forms populous, polygynous, crater-like or mound-like nests in boreal and alpine forests, commonly in sandy soil on beaches or shores. Rarely, organic matter is incorporated into the nest. May collect some seeds. Workers are black to blackish-brown, medium-sized to large, shy, and are found from coast to coast in North America, and as far north as the North West Territories and Alaska. Wheeler and Wheeler (1988) consider that this species is *F. subsericea* Say, although they are treated as separate species by Francoeur (1973). In our key, we treat them as a single species.

Localities: Nanaimo; Cordova Bay (WM); Vancouver (UBC); Agassiz (Francoeur 1973); Lytton (UBC); Jackass Mountain (WM); Cache Creek (RBCM); Osoyoos (above 800 m elevation) (Blades and Maier 1996); Westbank (WM, WBP); Oliver; Jesmond; Loon Lake (near Kamloops); Lower Nicola (WBP); Kaslo; Fort Steele; Field; Golden; Cranbrook (Francoeur 1973); Balfour (WBP); Lac la Hache (RBCM); Prince George (UBC); Terrace; Rolla (Francoeur 1973). Listed from the Yukon by Francoeur (1997).

F. subpolita Mayr: Constructs crater or mound-like nests, with one to four openings, in sandy or gravelly soil in dry areas. Occasional honeydew and seed collectors. Small to medium-sized ants with strongly shining head and gaster and feebly shining alitrunk. Head yellowish-red, alitrunk brown, and gaster dusky red.

Localities: Victoria (Blacker 1992); Vancouver Island (Francoeur 1973); Malakwa (Buckell 1927); Osoyoos (below 1500 m elevation) (Blades and Maier 1996); Oliver; Okanagan Falls; Kamloops; Lillooet (Buckell 1932); Lytton (UBC, RBCM); Vaseux Lake; Kelowna (Francoeur 1973); Westbank (CNC; Francoeur 1973); Williams Lake (Francoeur 1973); Chilcotin Region (Buckell 1932); Alberta (Sharplin (1966); Idaho (Yensen *et al.* 1977); Washington (Francoeur 1973) and Montana (Wheeler and Wheeler 1988).

F. transmontanis Francoeur: Almost nothing is known about the ecology of this species.

Localities: Lillooet; Seton Lake (Francoeur 1973); Malakwa (WBP); Tete Jaune Cache; Balfour (WBP); Fort Steele; Terrace (Francoeur 1973); Jack Ass Mountain (WM); Lens Mountain (RBCM).

F. xerophila Smith. Nests are founded under stones or wood and sometimes show craters or messy piles of excavated soil. The medium-sized workers have a dusky red gaster, brown to

reddish-yellow alitrunk, and a head that is reddish-yellow ventrally and dark reddish-brown dorsally. Francoeur (1973) reported this species from four states: Arizona, Utah, California, and Washington and stated that it appears to prefer arid environments. To our knowledge this is the first report of its occurrence in Canada.

Localities: Oliver; Osoyoos; Penticton (WBP).

Exsecta group. These ants build conspicuous mounds in fields, woods, or at the edges of woods. Nests may be founded by budding or by queens acting as temporary social parasites.

****F. ulkei*** Emery: Forms large mound nests, occasionally with a covering of plant debris, and located in clearings or edges of clearings in woodlands. The workers are large. Has been found at Edson and Peace River Alberta, predominantly in coniferous forests, but not in the mountains (Sharplin 1966). May be found in the Peace River region.

Rufa group. Nests are usually started beneath objects. Later they are marked by soil mounds or use of thatching, depending upon the species. We have followed the example of Wheeler and Wheeler (1986) by combining this and the following group (*microgyna*) in the keys, because with samples of workers only, the two groups are otherwise difficult to distinguish.

****F. dakotensis*** Emery: Usually found in grasslands but also reported from spruce bogs. Nests in earthen mounds or under stones or grass clumps, occasionally banked with detritus. Workers are medium-sized and feebly shining. The largest workers in a colony tend to have dark red heads, yellowish-red alitrunks, and reddish-brown to black gasters. Distributed from the Maritimes to Alaska, and south to New Mexico (Smith 1979), and therefore likely to be found in at least parts of BC. Has been found in the foothills and the Peace River region of Alberta (Sharplin 1966), from the Yukon (Francoeur 1997), and Montana (Wheeler and Wheeler 1988).

F. integroides Emery: Nests are built under logs and stumps banked with plant debris, and may contain tens of thousand of workers. The subspecies *F. integroides integroides* is likely to be found in the coastal mountains and on the west slope of the Cascades, and the subspecies *F. integroides propinqua* on the eastern slope (Smith 1979). Wheeler and Wheeler (1986) consider these two to be separate species. Workers are 5-8 mm long and dull. Major workers have orange heads, brown alitrunks, and reddish-brown gasters. Minors are more uniformly blackish-brown.

Localities: North Vancouver (GLA); Nicola (Buckell 1927); Osoyoos (below 1500 m elevation) (Blades and Maier 1996); Salmon Arm (Buckell 1932); Princeton (UBC); Westbank; Summerland; Kamloops; Lillooet (WM); Lytton (RBCM); Lower Nicola (WBP). Also reported from Montana (Wheeler and Wheeler 1988).

** ***F. laeviceps*** Creighton: Nests mostly under stones and logs, in open areas. Workers are small to large. The head is reddish, alitrunk yellow with brown markings, and the gaster black.

Localities: A single alate queen was found in a car at Revelstoke but may have entered the car east of the Rockies (WBP). Reported from Montana (Wheeler and Wheeler 1988).

F. obscuripes Forel: Nests in open areas. Nests are usually initiated at the base of a plant, while the finished nest is a large dome-shaped mound of detritus with some thatching. At higher elevations, the nests are often smaller and under a stone. The workers are active and will bite readily. This is one of the commonest ants in BC. Medium-sized to large. Head and alitrunk are yellowish to reddish-brown, and the gaster black.

Localities: Brentwood Bay (WM); Saltspring Island (UBC); Kaleden; Penticton; Minnic Lake

(Buckell 1932); Lillooet; Greenwood (WM); Chilcotin region (Buckell 1932); Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977), and Montana (Wheeler and Wheeler 1988).

F. obscuriventris Mayr: Nests in forests under logs and stones. Moderate use of thatching. Nests include small and large workers. Smaller workers are dull but larger workers have dull heads and feebly shining alitrunks and gasters. Heads are reddish, alitrunks brown or reddish-brown, and gasters with each segment reddish brown anteriorly and black posteriorly.

Localities: Sicamous (WM); Oliver; Balfour (WBP); Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

F. oreas Wheeler: Nests are found in wooded areas or grasslands, under stones or logs banked with debris. Workers range in size from small to large. Head and alitrunk are brownish, although sometimes yellowish-brown in larger workers, and the gaster dark reddish-brown to brown. Largest workers with head moderately shining, alitrunk and gaster dull. Smaller workers dull to feebly shining.

Localities: Oliver (Buckell 1932); Christina Lake; Kamloops (WM); Chilcotin region (Buckell 1932); Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

F. ravidia Creighton: (= *F. haemorrhoidalis* Emery) Found in areas of moderate to sparse vegetation cover. The nests are usually started under logs or stones, later incorporating moderate amounts of thatch. Workers are medium-sized to large with yellowish-red heads, reddish-yellow alitrunks, and dark reddish-brown gasters.

Localities: Victoria (UBC); Westbank (WM, WBP); Osoyoos (from valley bottom to 1850 m elevation) (Blades and Maier 1996; WM); Savona; Lillooet (WM); Balfour (WBP); Trail; Columbia Lake (WM); Blue River (WBP). Also reported from Montana (Wheeler and Wheeler 1988).

F. subnitens Creighton: Usually nests in grasslands. Nests are under stones and banked with debris, or are dome shaped mounds of thatch and detritus. Workers are small to large. The head is yellowish-red, alitrunk brown, and gaster reddish-black.

Localities: Vancouver (WM); Westbank (CNC; WM); Fruitvale; Trail; Field (WM). Reported also from Washington; Alberta (Smith 1979) and Idaho (Yensen *et al.* 1977).

***Microgyna* group.** Nests are usually thatched, the thatch scattered about the nest opening so as to resemble a flattened disc. Queens are believed to be temporary social parasites of other *Formica* species. They enter host colonies, are accepted by host workers, and produce their own worker brood. Eventually the host workers die out.

F. densiventris Viereck: (= *F. rasilis* Wheeler) Nests under stones or logs. The workers are small to medium-sized, dull, with reddish-brown head and alitrunk, and black gaster.

Localities: Westbank (GLA; WM); Lillooet (CNC); Idaho (Yensen *et al.* 1977).

F. microgyna Wheeler: Nests are usually begun under stones, in meadows or open forests. Thatch may be incorporated as the nest grows. The workers are small to medium-sized, mostly brownish, and dull to feebly shining.

Localities: Osoyoos (above 1500 m elevation) (Blades and Maier 1996). Also reported from Montana (Wheeler and Wheeler 1988).

F. spatulata Buren: Found under stones. Its host is *F. fusca*.

Localities: Oliver (WM). Also reported from Montana (Wheeler and Wheeler 1988).

F. whymeri Forel: Small nests under stones and logs, banked with plant debris. The workers are medium-sized, dull, with head and alitrunk reddish-yellow varying to dark brown, in all cases covered with dark brown infuscation, and gaster dark reddish-brown.

Localities: Emerald Lake (near Field)(Buckell 1927, 1932); Alaska (Nielsen 1987); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988). Probably in northern BC as well.

Sanguinea group. These are facultative slave makers of other *Formica* species, i.e., they often have slaves but can survive without them. They take over a nest by killing or driving off the host workers. Some also conduct slave raids.

F. curiosa Creighton: Workers are medium-sized to large, concolorous reddish-yellow, and dull. Their host is *Formica lasioides*. Reported by Smith (1979) as having been found in BC. Also reported from Montana (Wheeler and Wheeler 1988).

F. obtusopilosa Emery: Small colonies in meadows or grasslands. Workers are small to large with reddish brown to yellowish-red head and alitrunk, and black gaster. Head and gaster are feebly shining and the alitrunk is dull. Known to take *F. neogagates* slaves.

Localities: One stray collected at Oliver (WBP). Also reported from Montana (Wheeler and Wheeler 1988).

****F. puberula*** Emery: Workers are medium-sized to large and feebly shining. Head dark red to yellowish-red with dark brown to yellowish-red markings, alitrunk reddish-brown to brown, gaster dark reddish-brown. Hosts are *F. altipes*, *F. bradleyi*, *F. fusca*, *F. hewitti*, *F. neorufibarbis*, *F. pallidiflava*, *F. rasilis*, and *F. subpolita*. Listed from Alberta (Sharplin 1966), Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

****F. subintegra*** Emery: Workers are 5 - 6 mm long, with a brown gaster and reddish-yellow head, alitrunk and legs. Although Smith (1979) suggests a distribution that includes only eastern North America, this species was reported by Buckell (1927; 1932) from Vaseux Lake; and by Sharplin (1966) from Alberta.

F. aserva Forel: (= *F. subnuda* Emery) This ecologically versatile species will construct colonies in sunny locations in stumps or under stones, in fields, pastures, and forests. The nests may contain several hundred workers. Head and alitrunk of workers blood red, gaster black. Workers 6-8 mm long. Hosts are *F. accreta*, *F. altipetens*, *F. fusca*, *F. montana*, *F. neorufibarbis*, and *F. subpolita*. The range extends from Arizona through to Alaska (Smith 1979).

Localities: Cordova Bay, Victoria (WM); Hope (RBCM, WBP); Salmon Arm (Buckell 1932); Cache Creek (UBC); Osoyoos (above 1500 m elevation) (Blades and Maier 1996); Anarchist Mountain (WM); Balfour, Flathead (WBP); Lac La Hache (RBCM); Tete Jaune Cache (WBP). Also listed from Alaska (Nielsen 1987); Alberta (Sharplin 1966); the Yukon (Francoeur 1997); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988). Undoubtedly occurs in northern BC as well.

Polyergus

The members of this genus are obligatory or true slave makers. They conduct slave raids on nests of *Formica* spp. and bring back larvae and pupae. Some of these are consumed and others allowed to eclose as adults which then tend the brood of the slave-making queen.

P. breviceps Emery: The workers are medium-sized to large, pubescent, and yellowish-brown, except for the tip of the gaster which is slightly darker. The head and alitrunk are dull and the gaster feebly shining. There is a sudden and strong enlargement near the distal end of the antennal scape. Potential local hosts are *F. argentea*, *F. fusca*, *F. neoclara*, *F. neorufibarbis*, *F. pallidefulva*, and *F. subpolita*.

Localities: Osoyoos (between 800 and 1500 m elevation) (Blades and Maier 1996); Lillooet (CNC); Westbank (WM); Chilcotin region (Buckell 1932). Also listed from Alberta (Sharplin 1966); Idaho (Yensen *et al.* 1977) and Montana (Wheeler and Wheeler 1988).

DISCUSSION

In general, the diversity of ants in British Columbia is poor compared with more southern areas of North America even though the diversity of landforms and climatic zones is high. The relatively small number of species in this list (73 species reported from within BC) may be due in part to limited collecting and identification but it is probably also influenced by British Columbia's northern location. Table 1 illustrates the well-known decrease in ant diversity with increased latitude in the northern hemisphere. In the southern hemisphere, there is a corresponding decrease in species as the south pole is approached (Kusnezov 1957). As Table 1 shows, BC's ant diversity, as represented by this checklist, is more or less expected for our region.

There is also a decrease in species with increasing elevation (Kusnezov 1957). For example, Montana has 76 species of ants (Wheeler and Wheeler 1988) while North Dakota, with a generally lower elevation, has 86 species (Wheeler and Wheeler 1963). However, this difference may also be due, in part, to more intensive collecting in the latter state. As Table 1 shows, Montana and Idaho, both generally of the same latitude, also differ in species diversity. Idaho, with a greater ant diversity, has more areas of low elevation, extends further south, has a milder climate than states to the east of the Continental Divide (Hambridge, 1941), and southern Idaho has few geographical barriers between it and the rich ant diversity of southwest North America. It should not come as a surprise that British Columbia, with its diversity of landforms and ocean-moderated climate, has more ant species than in Manitoba, with 52 species (Wheeler *et al.* 1989).

Table 1

Numbers of ant species reported from areas of North America at different latitudes.

Location	Latitude	No. Reported Species	Reference
Central Alaska	62-66° N	18	Nielson (1987)
Yukon	60-69° N	18	Francoeur (1997)
British Columbia	49-60° N	73	This paper
Montana	45-49° N	76	Wheeler and Wheeler (1988)
Idaho	42-49° N	115	Yensen <i>et al.</i> (1977)
Nevada	35-24° N	176	Wheeler and Wheeler (1986)
Texas	26-37° N	181	Wheeler <i>et al.</i> (1989)
Costa Rica	8-11° N	329	Wheeler <i>et al.</i> (1989)

In this paper, we have not discussed exotic ant species temporarily established indoors. Naumann (1994) reported on two tropical species, *Wasmannia auropunctata* Roger (Myrmicinae) and *Paratrechina longicornis* Emery (Formicinae) established in a Vancouver tropical display. These species require high temperatures and humidity and are unlikely to survive outside of the exhibit.

Future collectors will undoubtedly find new native and exotic ant species in British Columbia.

The greatest numbers of species (and collectors) are likely to be found in drier and warmer areas of the south such as the Okanagan and Boundary districts. In aspects of plant life and climate, those areas represents the northern fringe of the Great Basin, an area rich in ant species, and also containing many biological transition zones. Northern British Columbia, on the other hand, has been particularly neglected with regards to collecting. Recently, Francoeur (1997) has listed the species known to occur in the Yukon, and many of them can probably be found in northern British Columbia. Small and subterranean species are also likely to be underrepresented in collections relative to those species that have larger workers, larger colonies, and active, terrestrial foragers. It is hoped therefore, that future work will add to the list of species presented here and to our knowledge of the distribution and ecology of individual species.

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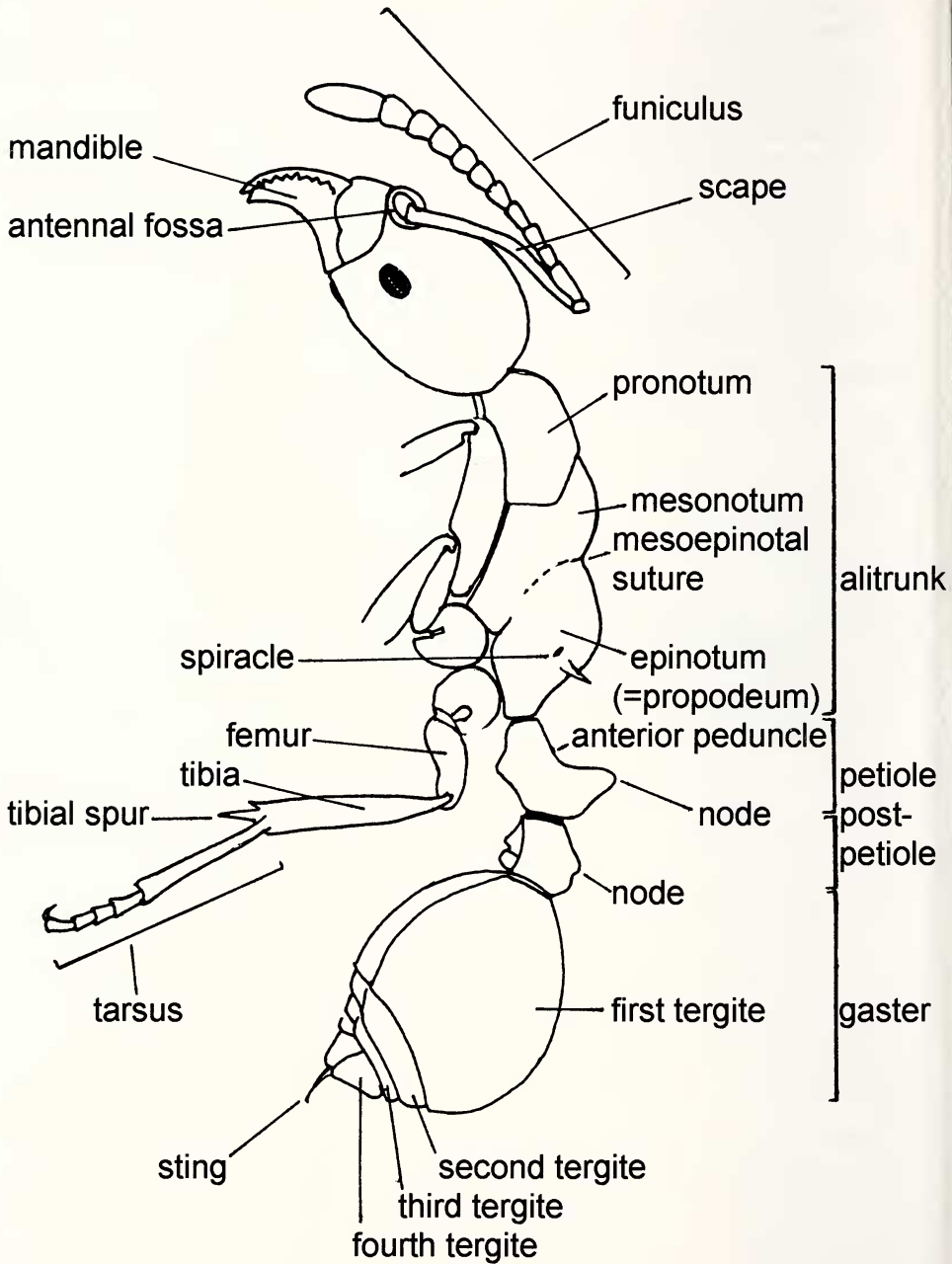


Figure 1. External anatomy of a typical ant showing many of the features referred to in the keys.

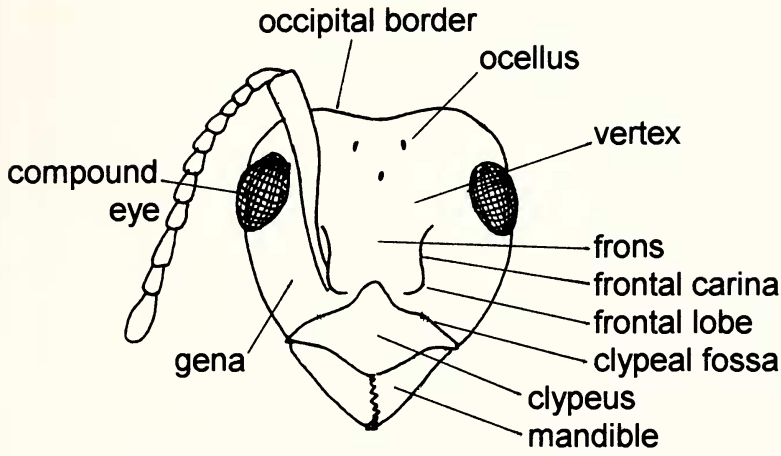


Figure 2. External anatomy of the head of a typical ant showing many of the features referred to in the keys.

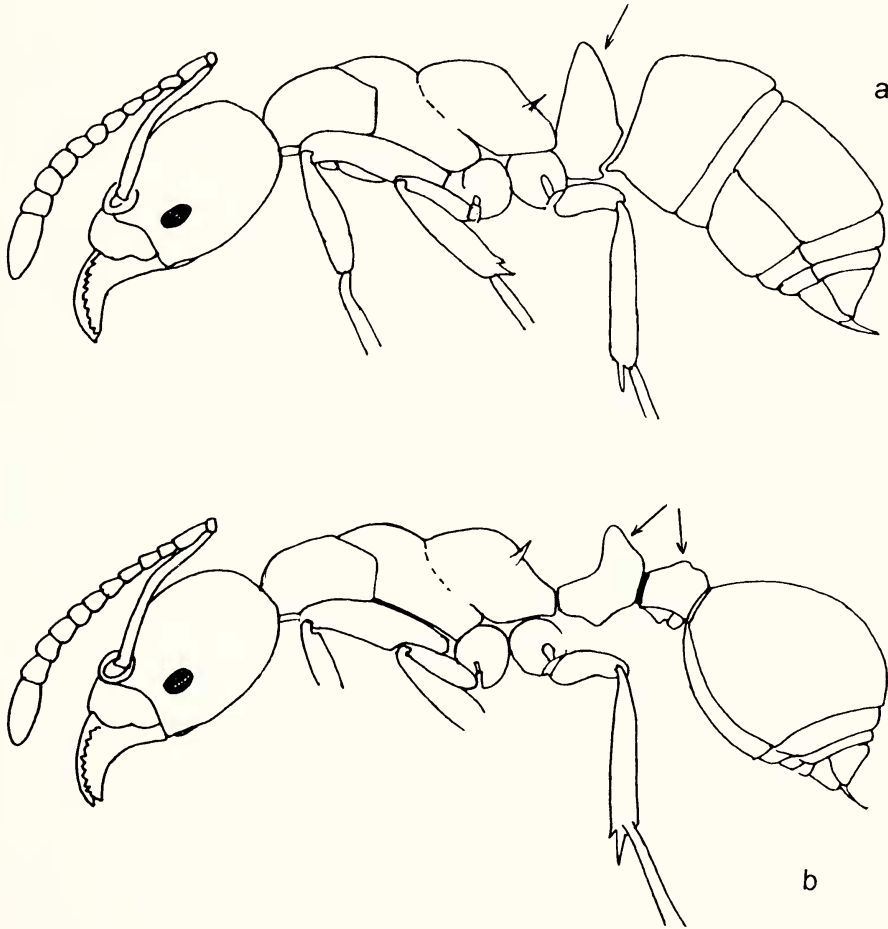


Figure 3. Features referred to in the Key to the Subfamilies. a) Ant with petiole; b) ant with petiole and postpetiole.

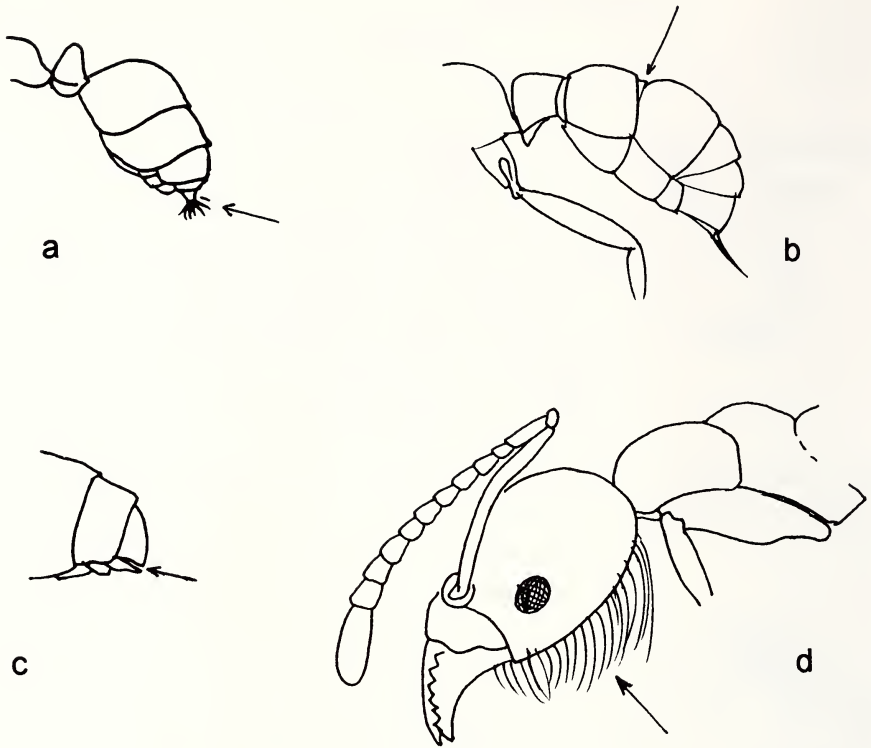


Figure 4. Features referred to in the Key to the Subfamilies and the Key to the Genera. a) Acidopore; b) constriction between first and second segments of gaster, typical of the Ponerinae; c) slit-like opening on gaster of Dolichoderinae; d) psammophore.

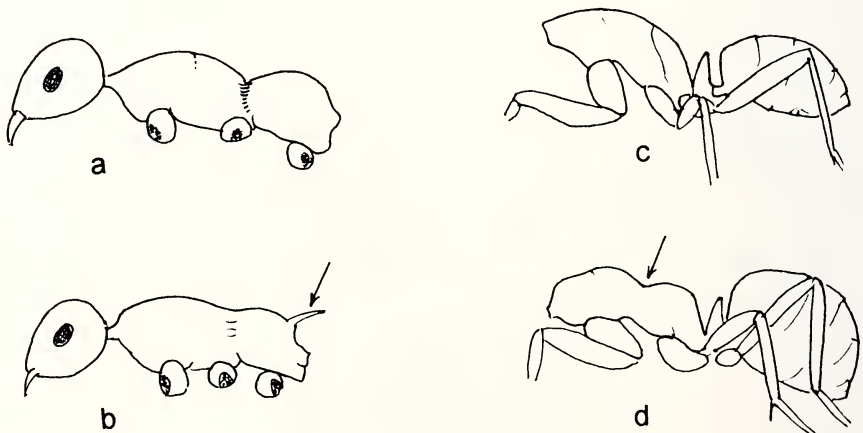


Figure 5. Features referred to in the Key to the Genera. a) Lateral view of propodeum lacking teeth; b) propodeum armed with teeth; c) profile of alitrunk typical of *Camponotus*; d) profile of alitrunk typical of *Formica* and *Lasius*.

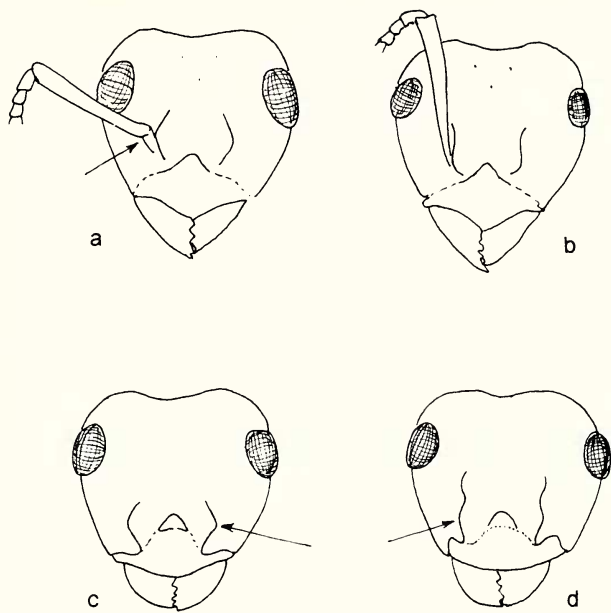


Figure 6. Features referred to in the Key to the Major Workers of the Species. a) Antennal scape forming a right-angled bend; b) antennal scape lacking a right angle; c) downward-deflected frontal lobes; d) rounded frontal lobes.

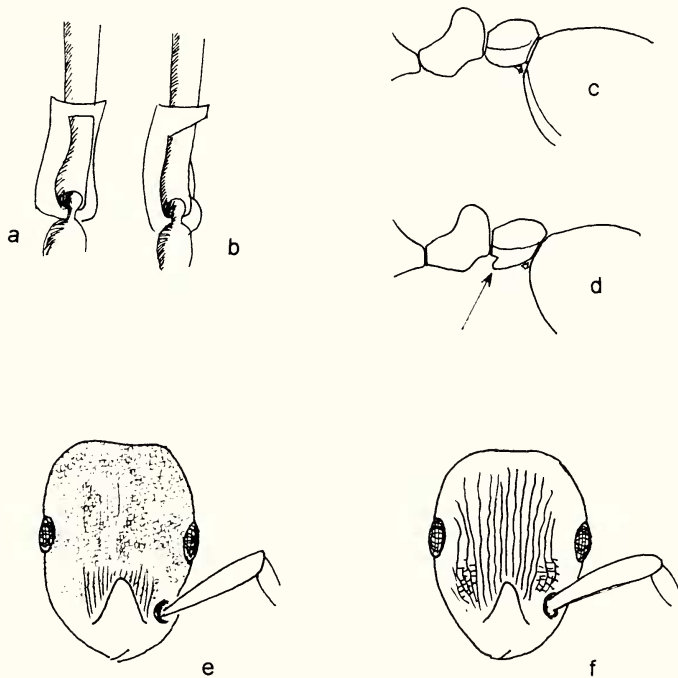


Figure 7. Features referred to in the Key to the Major Workers of the Species. a) Lamina on antennal scape typical of *Myrmica lobifrons*; b) antennal scape typical of *M. latifrons*; c) postpetiole showing a prominent tooth on the ventral surface; d) postpetiole lacking a ventral tooth; e) head of *Formicoxenus* female showing reticulated sculpturing; f) longitudinal lines on the head of a *Formicoxenus* female.

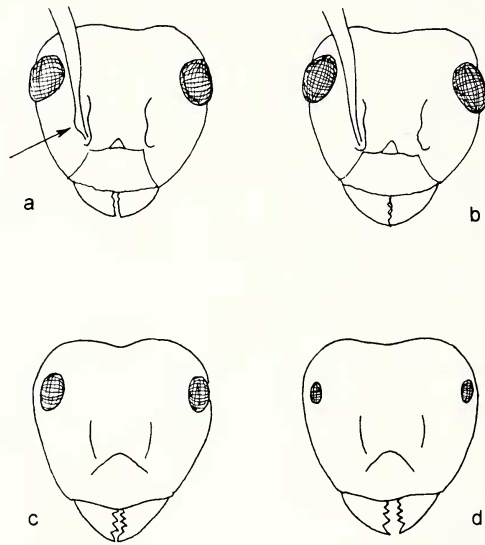


Figure 8. Features referred to in the Key to the Major Workers of the Species. a) Lateral lobe on antennal scape; b) antennal scape without a lobe; c) large-eyed *Lasius* species; d) small-eyed *Lasius* species.

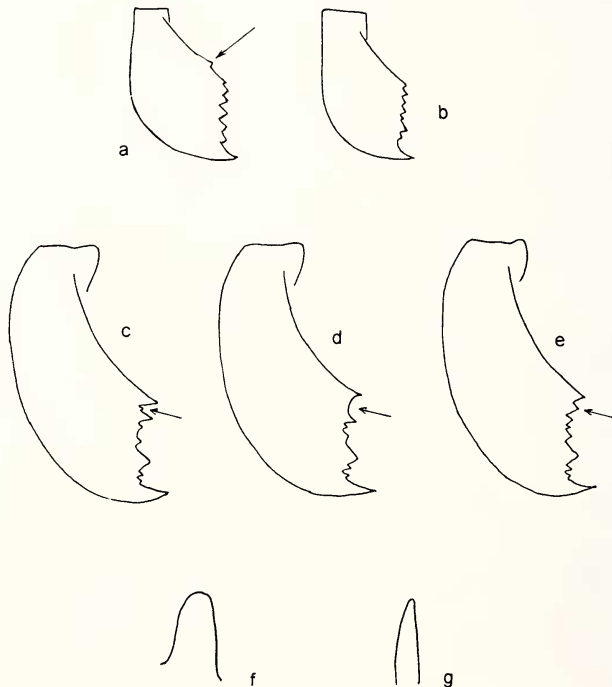


Figure 9. Features referred to in the Key to the Major Workers of the Species. a) Mandible with an offset tooth at the basal angle; b) mandible with basal tooth aligned with the other teeth; c) mandible with penultimate basal tooth of reduced size; d) mandible with a gap between the penultimate and basal tooth that exceeds the width of the basal tooth; e) mandible with penultimate and basal teeth of unequal size and the gap between them the same as the width of the terminal tooth; f) profile of a blunt-crested petiole; g) profile of a thin, sharp-crested petiole.

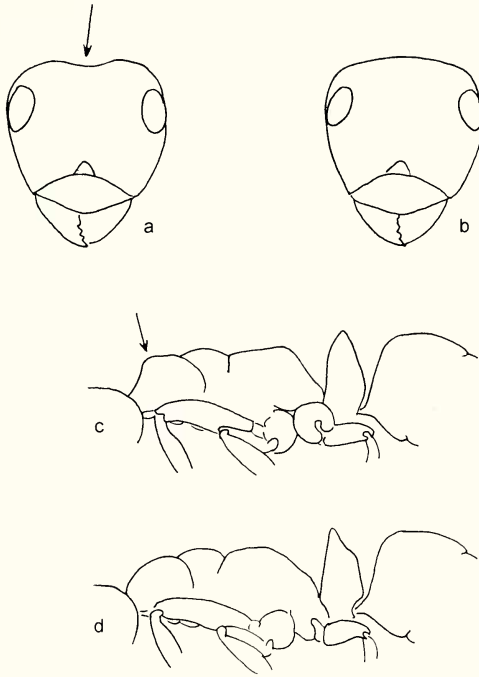


Figure 10. Features referred to in the Key to the Major Workers of the Species. a) Clypeus bearing a notch in the ventral border; b) clypeus without a ventral notch; c) profile of a rounded epinotum; b) profile of an angulate epinotum.

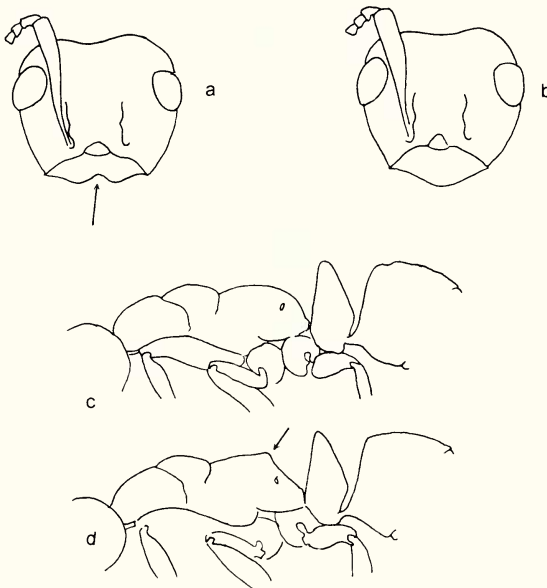


Figure 11. Features referred to in the Key to the Major Workers of the Species. a) Concave occipital border; b) non-concave occipital border; c) profile of pronotum with basal and declivitous faces meeting at an angle; d) profile of non-angulate pronotum.

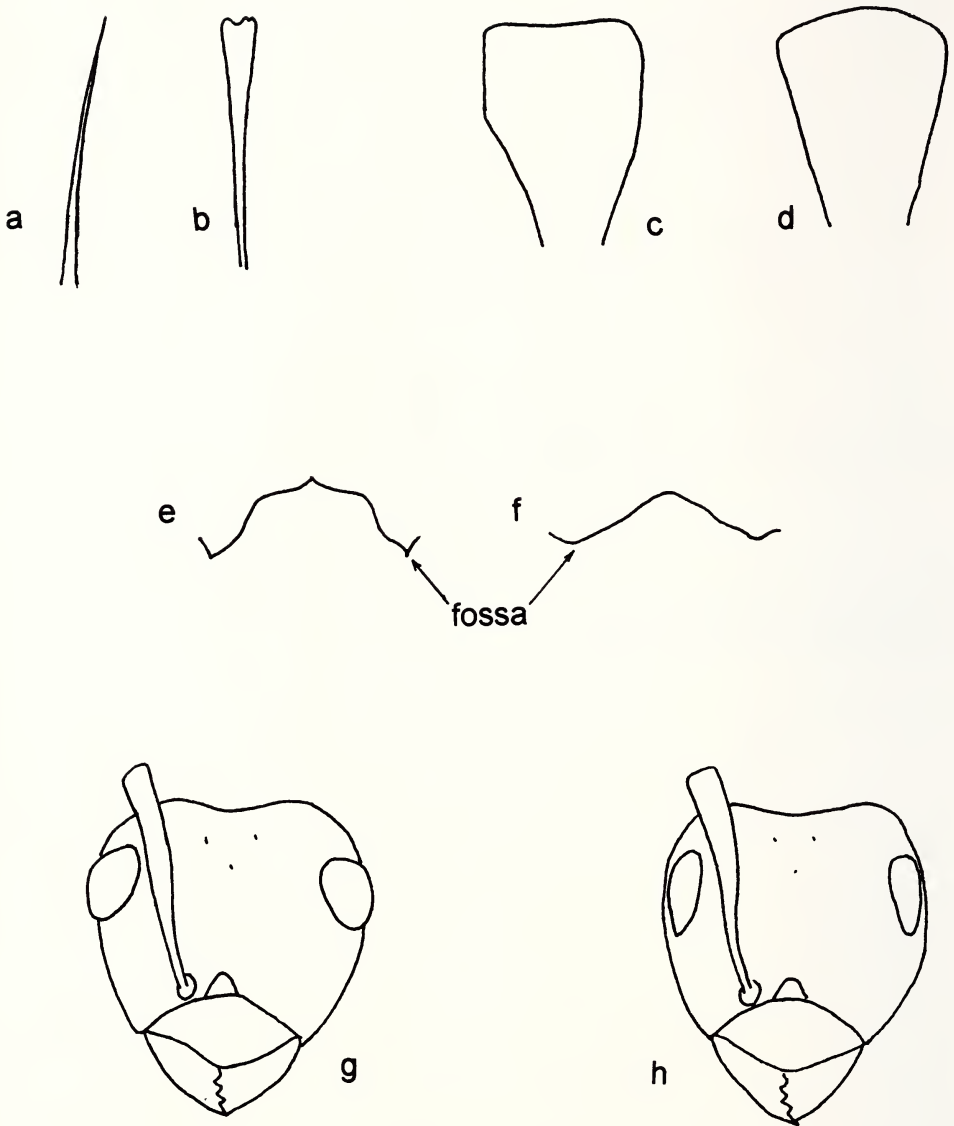


Figure 12. Features referred to in the Key to the Major Workers of the Species. a) Pointed, tapering seta; b) spatulate seta; c) posterior view of petiolar scale with a broadly concave crest; d) posterior view of petiolar scale with a convex crest; e) theoretical cross sectional view of the clypeus showing pit-like clypeal fossae; f) shallow clypeal fossae; g) protuberant eyes; h) flattened eyes.

Key to the Subfamilies of BC Ants

Based on the worker caste. Adapted and condensed from Hölldobler and Wilson (1990).

1. Body with a single reduced or isolated segment (the petiole) between alitrunk (what appears to be the thorax) and gaster (what appears to be the abdomen) (Fig. 3a)..... **2**
 Body with 2 isolated or reduced segments (petiole and postpetiole) between the alitrunk and the gaster (Fig. 3b)..... **Myrmicinae**
2. Sting replaced by an acid projecting system of which the acidopore is the orifice. Acidopore at apex of gaster, often projecting as a nozzle and fringed with setae (erect hairs) (Fig. 4a). If concealed, then antennal insertions located well behind the posterior clypeal margin. (The clypeus is the section of the head immediately above the mandibles).
 **Formicinae**
 No acidopore. Antennal fossae (sockets) touching the posterior margin of the clypeus..... **3**
3. Sting present and functional. Gaster with a distinct constriction between the first and second segments (Fig. 4b)..... **Ponerinae**
 Sting vestigial or absent. Gaster terminating in a horizontal slit-like opening (Fig. 4c)
 **Dolichoderinae**

Key to the Genera

Based on the worker caste. Adapted and condensed from Hölldobler and Wilson (1990).

Myrmicinae

1. Antennae with 10 segments, the last 2 forming a distinct club..... **Solenopsis**
 Antennae with 11 or more segments..... **2**
2. Antennae with 11 segments..... **3**
 Antennae with 12 segments..... **4**
3. Eyes with erect hairs..... **Formicoxenus**
 Eyes lacking erect hairs..... **Leptothorax** (in part)
4. Psammophore (a fringe of long hairs on the posterior surface of the head, usually in seed or nectar-collecting species; Fig. 4d) usually well developed; if absent, erect hairs are often present on the gula (posterior surface of the head) and the alitrunk is extensively and coarsely rugoreticulate (with wrinkles forming a network or grid). Combining following traits: petiolar node set off sharply from the long, distinctive anterior peduncle; the node in side view roughly triangular, usually with a short, steep anterior face, and a longer gradually sloping posterior face..... **Pogonomyrmex**
 A true psammophore rarely present, although scattered erect hairs on the gula occur fairly frequently. Anterior peduncle sometimes long, often short or absent. The petiole node in side view variable in shape, often roughly rectangular to quadrate. In rare cases where the anterior peduncle is long and the node triangular, then alitrunk is not coarsely and extensively rugoreticulate..... **5**
5. Dorsum of alitrunk flattened or convex, but without impressed sutures..... **6**
 Dorsum of alitrunk variously shaped in profile, but never forming a continuous surface; its outline always interrupted by one or more sutural impressions..... **8**

6. Frontal carinae long, extending rearward past the eye and reaching or almost reaching the vertex, and/or the clypeus nearly completely covered by conspicuous small, longitudinal wrinkles.....7
 Frontal carinae short, not extending past they eye, and never almost reaching the vertex. Clypeus variously sculptured or smooth and shining, but not covered by conspicuous small, longitudinal wrinkles.....*Leptothorax* (in part)
7. Antennal club 3-segmented.....*Tetramorium*
 Antennal club absent or indistinct.....*Myrmica* (in part)
8. Mandibles with 3 or 4 teeth. Propodeum (posterior region of the alitrunk) lacking teeth or spines.....*Monomorium*
 Mandibles with 5 or more teeth. Propodeum frequently bearing teeth or spines.....9
9. Antenna with a 3 or 4-segmented apical club.....10
 Antenna lacking an apical club, the terminal segments gradually enlarging towards the apex.....11
10. Clypeus with 2 longitudinal carinae (elevated ridges) that do not form teeth on the anterior margin. Workers monomorphic. Propodeum usually armed with small teeth. Antennae with 4-segmented apical club.....*Stenamamma*
 Clypeus never with 2 longitudinal carinae. Workers dimorphic, or rarely polymorphic. Majors (soldiers) often with greatly enlarged heads. Antennal club 3-segmented in most species.....*Pheidole*
11. Propodeum not armed with teeth or spines, almost always evenly rounded but rarely with small, blunt protuberances. Metanotal region (the narrow transverse band between the propodeum and the region in front of it (the mesonotum) strongly impressed; mesonotum and propodeum forming decidedly separate convexities in profile (Fig. 5a).....*Manica*
 Propodeum armed with teeth (sometimes small) or spines. Metanotal impression variable, sometimes absent (Fig. 5b).....12
12. Propodeum barely differentiated from remainder of alitrunk and at most slightly depressed below the level of the promesonotum in profile. Antennal scape (the long first segment) often bent abruptly near the base (sometimes nearly 90 degrees) and bearing more or less obvious parallel lines at the bend. In profile, metanotal region weakly to moderately impressed.....*Myrmica* (in part)
 Propodeum usually strongly differentiated from remainder of alitrunk and, in profile, always substantially depressed below the elevation of the pronotum, between which the mesonotum forms a more or less gradually sloping link. Antennal scape not abruptly bent at base, Rarely with lamina at base. Metanotal impression variable. Head longer than broad, and often much narrower behind the eyes than in front of them.....*Aphaenogaster*

Dolichoderinae

1. Metanotal region (narrow transverse band between mesonotum and propodeum) not impressed dorsally. Mesonotum and propodeum forming a smooth, continuous, flat, or convex profile. Ocelli usually present. Workers moderately polymorphic.....*Liometopum*
 Metanotal region slightly to strongly impressed dorsally, forming a shallow, concave depression, an angle, or a notch between the mesonotal and propodeal profiles. Ocelli usually absent. Workers monomorphic.....*Tapinoma*

Formicinae

1. Antennae 9-segmented.....*Brachymyrmex*
 Antennae 12-segmented.....2
2. Mandibles sickle-shaped, with numerous microscopic denticles (tooth-like processes). Petiole with prominent rounded node (not scale-like). Maxillary palps 4-segmented. Slave makers, found in mixed colonies with *Formica* spp.....*Polyergus*
 Mandibles more or less triangular, masticatory margin with 5 - 12 teeth. Petiole usually scale-like, sometimes with a rounded node. Maxillary palps 3 or 6-segmented. Mostly free-living species.....3
3. Maxillary palps 3-segmented and very short. Yellow to orange subterranean ants.....
*Acanthomyops*
 Maxillary palps 6-segmented and moderately to exceptionally long.....4
4. Maxillary palp longer than the head length (excluding the mandibles), the third and fourth segments each as long or longer than the 2 terminal segments combined. Psammophore (an array of long curved hairs beneath the head; Fig. 4d) usually present. In semi-arid habitats.....*Myrmecocystus*
 Maxillary palp not longer than the head length and usually distinctly shorter, its third and fourth segments not disproportionately long. Psammophore absent.....5
5. Profile of alitrunk continuous and evenly convex, with propodeum not depressed below the level of the promesonotum (Fig. 5c) and the meso-epinotal suture not or very slightly impressed. Alitrunk in dorsal view wedge shaped and tapering posteriorly.....*Camponotus*
 Profile of alitrunk clearly discontinuous and not evenly convex, the meso-epinotal suture always distinct, and the propodeum distinctly depressed below the level of the promesonotum (Fig. 5d). Alitrunk in dorsal view not wedge shaped, usually constricted to some degree in the middle.....6
6. Larger ants; 2.5 - 9 mm long, usually 4.5 - 9 mm. Frontal carinae short but distinct, each a small ridge with a moderately to strongly angulate summit that is slightly reflected upwards. Lower rim of antennal socket nearly touching the posterior border of the clypeus, the distance between them less than 1/4 the maximum diameter of the antennal socket. The basal face of the propodeum usually longer than the downward-sloping one. Ocelli very distinct. Epinotal spiracle a narrow slit.....*Formica*
 Smaller ants; 2 - 4.5 mm long, usually 2 - 3.5 mm. Frontal carinae indistinct or absent. If present, each carina is a small ridge with a distinctly rounded summit. Distance between the lower rim of the antennal socket and posterior clypeal border commonly 1/3 or greater the maximum diameter of the antennal socket. Downward-sloping face of the propodeum decidedly longer than the basal face, both faces meeting so that the propodeal profile resembles a distinct upwards-facing peak with a more or less rounded apex. Ocelli indistinct or absent. Abdomen often plump. Usually yellow-brown in colour. Epinotal spiracle rounded.....*Lasius*

Key to the Major Workers of the Species

Adaped from Creighton (1950), Wheeler & Wheeler (1986), and other authors for specific groups (see text).

PONERINAE

Amblyopone

The only species likely to be found locally is.....*oregonense*

MYRMICINAE

Myrmica

1. Antennal scape gradually and evenly bent at the base, the upper surface never forming a right angle at the end (Fig. 6b).....**2**
 Antennal scape suddenly bent at base, the upper surface forming a right angle. Lamina (Parallel lines) always present, and of various shapes, but never absent from the upper surface of the scape (Fig. 6a).....**3**
2. Lateral margins of the frontal lobes, i.e., lobes of the frons, strongly angular, thick and slightly but definitely deflected downwards (Fig. 6c). Head and alitrunk with dense pattern of grooves (sulci).....*incompleta*
 Lateral margins of the frontal lobes rounded, thin, and moderately to strongly elevated (Fig. 6d). Colour orange yellow. Distinguished from other members of the genus by short propodeal spines and a large inter-lamellar surface on the head.....*brevispinosa*
3. Lamina of antennal scape forming a high or wide semicircular flange which surrounds the scape where the scape bends (Fig. 7a).....*lobifrons*

Lamina on antennal scape, small and diagonally transverse on the upper surface of the scape, but continued as a prominent transparent flange along the inner surface of that part of the scape that lies below the bend (Fig. 7b).....*latifrons*

Manica

1. Ventral surface of postpetiole with a prominent tooth (Fig. 7c). Antennal scape surpassing the occipital border by an amount equal to its greatest thickness. Colour is deep reddish orange.....*hunteri*
 Postpetiole without a ventral tooth or projection (Fig. 7d). Posterior node of the petiole sculpted and dull. Colour is dull yellow to orange.....*invada*

Pogonomyrmex

The only species reported from BC is.....*salinus*

Stenamma

1. Middle region of the side of the alitrunk (mesopleuron) densely punctate (with many small pits) but rugulae (multiple small wrinkles) feeble or lacking. Side of the pronotum with conspicuous coarse punctures between the rugulae, the latter often lacking. Basal striae (multiple impressed lines) of the first gastric tergite lacking or inconspicuous.....*occidentale*
 Mesopleuron with several rugulae, interspaces feebly punctate or impunctate. Side of pronotum rugulose, the interspaces without punctures or rarely a few fine punctures ventrally. The first gastric tergite with distinct basal striae in most specimens.....*diecki*

Aphaenogaster

The only species reported from BC is.....*occidentalis*

Pheidole

The only species reported from BC is.....*californica*

Monomorium

1. Light reddish-yellow. Head and alitrunk with many small pits. Dull or feebly shining.....*pharaonis*
2. Brownish-black to black. Head and alitrunk mostly, or entirely smooth and strongly shining.....*minimum*

Solenopsis

Collectors are only likely to encounter.....*molesta*

Leptothorax

1. Antennae 12-segmented.....*nevadensis*
 Antennae 11-segmented.....2
2. Clypeus with a small median carina, or with several. Mesoepinotal suture seldom present on the thoracic dorsum and never impressed. Thoracic rugae (wrinkles) well developed. Gaster concave at junction with postpetiole.....*rugatulus*
 Clypeus without a median carina, its center usually depressed to form a shallow, longitudinal trough. Mesoepinotal suture regularly present on the thoracic dorsum and usually depressed slightly below the level of the alitrunk. Erect setae sparse, short, and usually clavate (club-shaped). Interrugal punctures on the alitrunk shallow and sparse, the surface where they occur moderately shining. Gaster slightly convex at junction with postpetiole.....*muscorum*

Formicoxenus

Adapted from Francoeur et al. (1985).

1. Frons and occiput with a reticulated pattern (Fig. 7e). A guest in nests of members of the *Formica rufa* species group.....*diversipilosus*
 Frons and occiput with strong, longitudinal lines (Fig. 7f).....2
2. Sternum of postpetiole not sagittally compressed and as long as high. Propodeal spines longer than wide at the base in most specimens. Found in nests with *Myrmica incompleta*.....*provancheri*
 Sternum of postpetiole sagittally compressed. Propodeal spines shorter than they are wide at the base. Found in nests with *Myrmica alaskensis*.....*quebecensis*

Tetramorium

The only species likely to be found in BC is.....*caespitum*

DOLICHODERINAE

Liometopum

A species reported from BC but unlikely to occur here is.....*apiculatum*

Tapinoma

The only species reported from BC is.....*sessile*

FORMICINAE***Brachymyrmex***

The only species likely to be found locally is.....*depilis*

Camponotus

1. Length of major workers at most 8 mm. Anterior border of the clypeus feebly projecting, depressed in the middle and with a narrow, median notch, behind which is a short, triangular impression.....**2**
Length of major workers usually greater than 8 mm. Anterior border of the clypeus not as above, without a median notch in most specimens, but when one is present, there is no impression behind it.**3**
2. Frontal lobes feebly shining to dull, distinctly shagreened (rough) and punctured. Sides of the head in the larger workers, at most, moderately convex and not unusually narrowed at level of the mandibles.....*nearcticus*
Sculpture of the frontal lobes shiny and punctured with only faint shagreening. Sides of the head in the major strongly convex and narrowed at the level of the mandible.....*hyatti-essigi* complex
3. Clypeus distinctly carinate. The antennal scape flattened at the base. Antennal sockets shallow over most of their length. Head (mandibles excluded) as long as broad, or distinctly longer than broad.....**4**
Clypeus not or feebly carinate. Antennal scapes never flattened at the base. Clypeal fossae well marked. Head (mandibles excluded) at least a little broader than long.....**5**
4. Scape distinctly flattened, the flattened portion forming a small lateral lobe (Fig. 8a).....*semitestaceus*
Scape also flattened, but lacking the lateral lobe (Fig. 8b). Large ants with red alitrunk and legs, black head and gaster.....*vicinus*
5. Antennal scapes with a number of short, scattered, erect setae. Entire insect jet black and very shining, often with strong bluish reflections.....*laevigatus*
Antennal scapes without erect setae except for a small cluster at the extreme tip. Color not as above; if all black, the surface is not strongly shining.....**6**
6. Antennal scapes reaching or barely surpassing the occipital corners. Alitrunk black anteriorly, red posteriorly. Gaster dull.....*herculeanus*
The antennal scapes of the majors surpassing the occipital corners by an amount greater than their greatest diameter.....**7**
7. Pubescence on the gaster absent or very fine and sparse, the entire surface of the gaster distinctly shining. Punctures on the head coarse and conspicuous. Head and gaster brownish black, alitrunk red.....*noveboracensis*
Pubescence on gaster coarse, golden, dense, and about half as long as the erect setae. The surface of the gaster dull except for a narrow band at the posterior edge of each segment. Colour is all black.....*modoc*

Lasius

Adapted from Wilson (1955).

1. Eye large, its maximum diameter 0.20 x head width or more (Fig. 8c).....**2**

- Eye small, its maximum diameter 0.17 x head width or less (Fig. 8d).....6
2. All larger workers and most smaller ones with one or more offset teeth at the basal angle (i.e. closest to the opening of the mouth) of the mandible (Fig. 9a).....*pallüarsis*
Posterior basal tooth aligned with the other teeth of the masticatory border (Fig. 9b).....3
3. In one or both mandibles of a majority of the workers in a nest, either the penultimate basal tooth is markedly reduced in size relative to the two flanking teeth (Fig. 9c), or the gap between the penultimate and terminal basal teeth tends to be larger in width than the terminal basal tooth (Fig. 9d). When viewed with the mandibles opened and the head held in perfect full face, the anterior border of the median clypeal lobe is angulate, i.e., formed of two straight sides meeting at the midline to form an obtuse, usually pointed angle.....4
In all of the workers of a nest, with rare exceptions, the penultimate and terminal basal teeth are subequal in size, and the gap between them has about the same width as the terminal tooth (Fig. 9e). When viewed with the mandibles opened and the head held in full face, the anterior border of the median clypeal lobe is evenly curved, with the sides at least feebly convex and only occasionally meeting at a point at the midline.....5
4. The scapes and tibiae bearing erect setae. Body colour light brown to medium brown, very rarely darker.....*neoniger*
The scapes and tibiae lacking erect setae and usually without setae of any inclination (but pubescence still present). Colour typically dark brown.....*crypticus*
5. For those workers with a pronotal width of 0.53 to 0.7 mm, scapes and tibiae bearing few or no standing hairs; usually less than 10 setae.....*alienus*
Within the same size range, scapes and tibiae bearing many setae; the seta count usually greater than 10.....*niger*
6. Eyes with less than 35 ommatidia (facets).....7
Eyes with more than 35 ommatidia.....8
7. Outer surface of each tibia with numerous erect setae prominent above the background pubescence.....*fallax*
Outer surface of each tibia with at most 1 or 2 erect setae.....*flavus*
8. Setae on posterior half of first gastric tergite, exclusive of the extreme posterior strip, at least in part lying flat or at an angle of less than 45 degrees, and approximately 0.1 mm long. Erect setae sparse or absent on the lateral tibial surfaces.....*subumbratus*
Erect setae at posterior half of first gastric tergite, exclusive of the extreme posterior tip, almost entirely erect or suberect, and 0.12 mm or more in length. Erect setae often abundant on the lateral tibial surfaces.....*vestitus*

Acanthomyops

1. The antennal scapes, when lying against the head, surpassing the occipital margin by an amount at least as great as the thickness of the tip. Erect setae long and coarse. Gastric pubescence sparse, the gastric surface strongly shining. Erect setae on gastric dorsum 0.23 mm long or longer.....*interjectus*
The antennal scapes, when lying against the head, not reaching the occipital margin, or if they do, the amount that projects beyond the margin is less than the thickness of the tip. Erect setae on the gastric dorsum 0.22 mm or less.....2

2. Fore femora without erect setae, or when present, mainly confined to flexor surface with only a few inconspicuous erect setae at the base of the lateral surface. Crest of petiole sharp in side view. Most of body and appendages pubescent.....*occidentalis*
Fore femora with erect setae occurring over much of the lateral surface as well as the flexor surface.....**3**
3. Scale of the petiole, in profile, with a blunt crest (Fig. 9f); seen from behind the crest is convex or flattened in the middle but never deeply notched.....*latipes*
Scale of the petiole, in profile, with a thin, sharp crest (Fig. 9g); seen from behind the crest is usually deeply notched in the middle but at least with a distinct medial depression.....*coloradensis*

Formica

Key to the Major Workers of the Species Groups of *Formica*

Adapted from Wheeler & Wheeler (1986). Creighton (1950) presented an alternate key that recognized the microgyna species group but it requires inspection of the queens. Wheeler & Wheeler (1986) combined the microgyna and rufa species group so that only examination of the major workers is needed.

1. Ventral border of clypeus notched in the middle (Fig. 10a). Integument dull to feebly shining; pubescence dense, at least on gaster. Bicoloured (except concolourous reddish yellow in *curiosa*), head and alitrunk reddish brown or reddish yellow, gaster brown or black; epinotum short and usually angulate in profile.....*sanguinea* group
Ventral border of clypeus not notched (Fig. 10b) or if so, pubescence is very sparse and body shining; other characters not all as above.....**2**
2. Slender; surface shining. Epinotum rounded in profile (i.e., base and declivity not differentiated; Fig. 10c).....*neogagates* group
Generally robust; surface usually dull. Epinotum usually angulate in profile (i.e., base and declivity clearly differentiated; Fig. 10d).....**3**
3. Larger workers with occipital border distinctly concave (Fig. 11a). Pronotum (in profile) with basal and declivitous bases meeting at an angle (Fig. 11c).....*exsecta* group
Larger workers with occipital border at most slightly concave, usually flat or slightly convex (Fig. 11b). Pronotum (in profile) evenly convex, not angulate (Fig. 11d).....**4**
4. Bicoloured; head and alitrunk reddish or yellowish-red and notably lighter than gaster or, if infuscated (with darkened patches), infuscation not completely masking reddish ground colour in larger workers; gaster brown or black; surface mostly dull; (frontal carinae strongly divergent in *rufa* group).....*rufa* and *microgyna* groups
Concolourous black or brown or bicoloured; if bicoloured, alitrunk lighter than gaster and upper portion of head; frontal carinae moderately divergent dorsally, often parallel.....*fusca* group

Neogagates Species Group

Adapted from Wheeler & Wheeler (1986) and Snelling & Buren (1985).

1. Extensor surfaces of the antennal scapes bearing a number of short, very delicate, erect, whitish setae.....*lasioides*
Antennal scapes without erect hairs except for a small cluster at the extreme tip.....**2**

2. Head and alitrunk usually reddish-yellow, gaster black. Length of largest worker 4.5 mm *manni*
 Gaster black or deep brown, head and alitrunk brownish. Largest workers 5.5 mm long.....3
3. Alitrunk paler than head and gaster. Setae on gaster long. Appressed (lying flat or at an acute angle) pubescence sparse..... *vinculans*
 Alitrunk not paler than head and gaster. Setae on gaster short. Abundant appressed pubescence..... *neogagates*

Fusca Species Group

Adapted from Francoeur (1973) and Wheeler & Wheeler (1986).

1. Metasternum with 2 distinct, seta-covered processes arising on each side of the spinasternal cavity (a small cavity associated with a pair of spines and located medially, between the second and third pairs of legs).....2
 Metasternum without hairy processes.....4
2. Erect setae of gastric dorsum long and flexible, tapering from base to apex. Gastric surface strongly shining. Workers strongly polymorphic..... *subpolita*
 Standing hairs on gastric dorsum short and bristle-like, or the same diameter for most of their length, then either truncate or abruptly tapered. Gastric surface feebly shining or dull. Monomorphic or feebly polymorphic.....3
3. Erect setae present on ventral surface of head, occiput (uppermost part of the head), propodeum, and epinotum..... *montana*
 Erect setae absent from ventral surface of head, gena, propodeum, and epinotum *neoclara*
4. Body concolorous: black, blackish or yellowish brown, or if appearing bicoloured, alitrunk yellow and very pilose or alitrunk reddish and the upper half of the head black.....5
 Body bicoloured: head, alitrunk, and petiole reddish or reddish brown, gaster black or blackish brown. Surface dull and granulose..... *xerophila*
5. The portion of the gena lying between the eye and the insertion of the mandible covered with coarse, elongate punctures, widely spaced in the posterior half of the gena. The surface between them covered with coarse lines readily seen under low magnification. Setae on gastric dorsum very short and pubescence sparse, at least on the posterior half. Metasternal setae abundant and surrounding the spinasternal cavity.....6
 Genae without coarse, elongate punctures, or if present, the punctures are concentrated mostly in the posterior half of the genae, where they are mixed with fine circular punctures and are closely spaced. The surface between them is covered with delicate lines that can hardly be seen under low magnification. Setae and pubescence variously combined. Few hairs surrounding the spinasternal cavity.....7
6. Erect setae abundant, especially on the ventral surface of the head, occiput, prosternum, and dorsal margin of the petiole and the gastric dorsum. Body brownish black or black..... *hewitti*
 Few setae, in particular on those structures named above. Anterior half of head and alitrunk usually reddish..... *neorufibarbis*

7. Erect setae abundant, particularly on the ventral surface of the head, occiput, promesonotum, metafemora, dorsal margin of the petiole, and propodeum.....**8**
 Erect setae reduced, in particular, absent on propodeum, dorsal margin of the petiole and at least one of the other mentioned structures.....**10**
8. Occipital angles, and genae with erect setae.....*transmontanis*
 Occipital angles, and genae without erect setae.....**9**
9. Anterior margin of clypeus convex. Crest of petiole, when seen from behind usually without a notch. Head rounded, with convex sides.....*aerata*
 Anterior margin of clypeus angulate and prominent in the middle. Crest of the petiole usually with a median notch. Head rectangular, with straight sides.....*pacifica*
10. Erect setae abundant on the first gastric tergite, rarely less than 10 setae, exclusive of the posterior row (mean = 20). Setae around only the posterior portion of the spinasternal cavity.....**11**
 Rarely more than 10 erect hairs, excluding posterior row (mean = 4) on the first gastric tergite. Setae surrounding the spinasternal cavity.....**12**
11. Pubescence on the genae and first 4 gastric tergites very dense. Big elongate punctures absent on the genae, beneath and behind the eyes. Pronotum usually with some short, erect setae. Gastric dorsum usually with numerous short and somewhat swollen erect setae. Blackish brown to brown, and about 5 mm long.....*argentea*
 Pubescence sparse to normal on the fourth gastric segment and on the genae, at least on the posterior half. Big, elongate punctures present on the genae, beneath and behind the eyes. Black coloured.....*podzolica*
12. Antennal scape longer than head. Anterior margin of clypeus angular in most specimens. Diameter of eye 0.43 - 0.54 mm.....*accreta*
 Antennal scapes often shorter than head length. Anterior margin of the clypeus broadly convex, rarely angular in the middle. Diameter of eye 0.35 - 0.46 mm.....*fusca*

Exsecta Species Group

The Peace River region may be home to colonies of.....*ulkei*

Rufa and *microgyna* species groups

Adapted from Wheeler & Wheeler (1963, 1986), Gregg (1963), and Creighton (1950).

1. Scapes with erect or suberect setae on all surfaces.....**2**
 Scapes with very few or no erect setae.....**3**
2. All setae tapering to sharp points; thoracic hairs slender and unequal in length (Fig. 12a).....*oreas*
 Some setae spatulate (spade-shaped) (Fig. 12b); thoracic setae all short and subequal in length.....*microgyna*
3. Petiolar scale (seen from behind) with a flat or broadly concave crest; sides of upper half of scale parallel, tapering inward only in lower half (Fig. 12c).....*dakotensis*
 Petiolar scale (seen from behind) with crest convex or angularly produced upward in middle; sides of scale tapering inward from crest to base (Fig. 12d).....**4**

4. Clypeal fossa deep and pit-like (Fig. 12e); edge of clypeus ventral to pit sweeping upward to median lobe; median lobe box-like (i.e., sides descending abruptly to fossae and making angles with its anterior face).....**5**
 Clypeal fossa shallow and scarcely pit-like (Fig. 12f); edge of clypeus ventral to pit broadly united to base of lobe and not forming a distinct curve with it; median lobe not box-like (i.e., sides descending to fossae through even curves which begin at carina).....**6**
5. Middle and hind tibiae with numerous erect setae on all surfaces.....*obscuriventris*
 Middle and hind tibiae without erect setae except for double row on flexor surfaces...*laeviceps*
6. Erect setae on middle and hind tibiae usually abundant on all surfaces, but there are at least 3 erect setae in addition to those on the flexor surfaces.....*obscuripes*
 Erect setae on middle and hind tibiae, when present, confined to double row on flexor surface, rarely 1 or 2 erect hairs elsewhere.....**7**
7. Clypeus, gula (posterior surface of head), and gena strongly shining.....*subnitens*
 Clypeus, gula, and gena dull.....**8**
8. Gula, crest of petiole, and thoracic dorsum usually without erect setae, rarely 1 or 2 inconspicuous setae.....*haemorrhoidalis*
 Pronotum, epinotum, and crest of petiole with numerous erect hairs on many of the workers in a nest.....**9**
9. Erect setae slender and pointed at tip.....*integroides*
 Erect setae blunt and spatulate.....**10**
10. Erect setae never present on crest of petiole; pubescence on gastric dorsum rather sparse and not wholly concealing the surface at the rear edges of the segments; sides of gaster strongly shining.....*whymperi*
 Erect setae always present on crest of petiole; pubescence on gastric dorsum dense and wholly concealing surface at rear edge of segments; sides of gaster feebly shining.....**11**
11. The majority of the erect setae on the dorsum of the head and alitrunk notably spatulate and rather short.....*spatulata*
 Erect setae on the dorsum of head and alitrunk sparse and inconspicuous, when present, blunt at the tip but not notably spatulate, except for a few on the pronotum.....*densiventris*

Sanguinea Species Group

Adapted from Wheeler & Wheeler (1986).

1. Concolourous yellowish red.....*curiosa*
 Bicoloured: head and alitrunk reddish brown or yellow, gaster brown or black.....**2**
2. Dorsum of alitrunk entirely devoid of erect setae or with a few fine, short inconspicuous erect setae on pronotum only.....*aserva*
 Dorsum of pronotum and mesonotum with conspicuous erect setae erect setae usually present on epinotum also.....**3**
3. Gaster evenly covered with long, stout, silver, erect setae, which are blunt at tip; hairs elsewhere only a little less dense.....*obtusipilosa*
 Erect gastric setae yellow and not notably blunt; erect setae elsewhere much shorter and

sparser.....4

4. Eye large and protuberant, its longest diameter approximately 1/3 length of head, in front view always interrupting lateral border of head (Fig 12g).....*curiosa*

Eye flattened, less than 1/3 length of head, in front view not interrupting lateral border of head (Fig. 12h); pubescence on scape abundant, suberect, and conspicuous.....*puberula*

Polyergus

The only species reported from BC is.....*breviceps*